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# General Aviation airworthiness ALERTS

ALERT NO. 42
JANUARY 1982

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Flight Standards National Field Office

TD 4.414:

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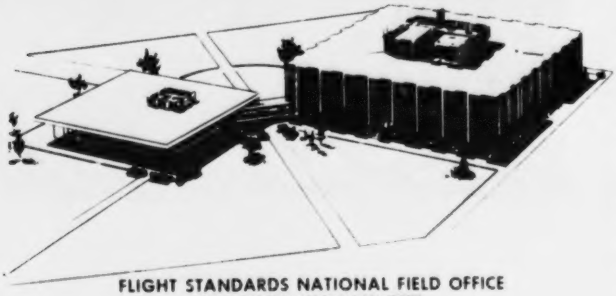
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

ADVISORY CIRCULAR
AC 43-16

# GENERAL AVIATION AIRWORTHINESS ALERTS

JANUARY 1982



FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

### AIR TRACTOR

Air Tractor
Model AT-301

Landing Gear Strut

Both main landing gear struts failed while taxiing from a chemical loading ramp. Total time on the gear struts was 1,780 hours with approximately 1,400 landings. The picture depicts a fatigue area of the right main gear strut.

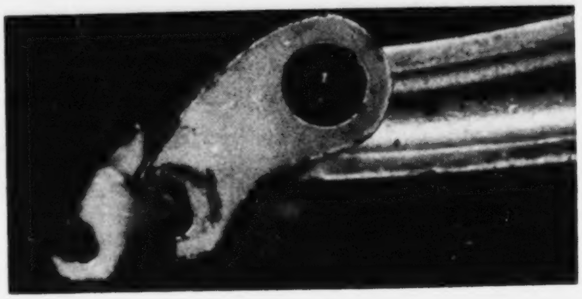
NOTICE TO READERS: The General Aviation Airworthiness Alerts are, for the most part, prepared from information supplied by those who operate and maintain aircraft. The FAA encourages the reporting of all malfunctions or defects that come to the attention of service or operating personnel, even though the problem has been previously reported. The Malfunction or Defect Report, FAA Form 8010-4, which supersedes Form 8330-2, is available from the local General Aviation District Office, and may be used for reporting purposes.

## BEECH

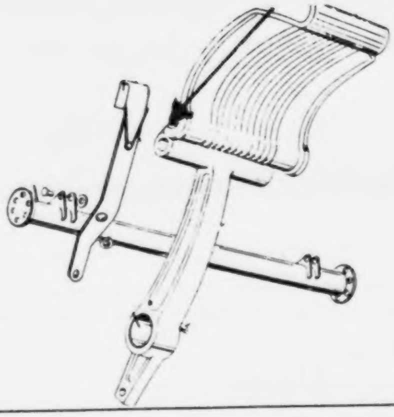
| | | |
|---|---|---|
| Beech<br>Model 77 | Cracked Engine Mount | The engine mount was found cracked on an aircraft with 398 hours total time. Similar condition found on another aircraft and the engine mount bolts to the nose landing gear were found loose - not enough torque. |

Beech
Models 65, 65-80 Series, 65-88, 65-90, 90 Series and 99 Series

Rudder Pedal Arm, P/N 50-524326



The holes in the rudder pedal arms ( used to attach the brake pedals) have been found excessively worn, and in some instances, have completely broken out. The reports indicate these conditions may have been the result of abnormal forces used in repeated brake application and when setting or releasing the parking brake.



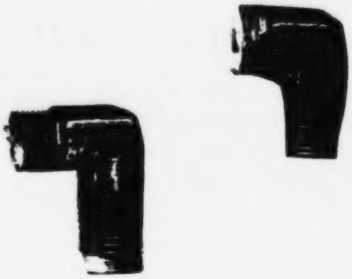
Changes have been made to include a steel bushing at the brake pedal attachment. Beechcraft Airliner Communique No. 25 and King Air Communique No. 42 contain guidance information and rework procedures relative to installing the steel bushings in the pedal arm.

This article was published in the 1976 General Aviation Inspection Aids.

There was a recent report of a rudder pedal separating on a Beech 99A during run-up prior to takeoff. An investigation revealed the pivot points were severly worn and had broken which allowed the pedal to separate.

Beech
Model 95-B55

Heater Fitting



There have been additional reports of finding the aft lower 90 degree fitting on the Janitrol heater cracked, corroded and totally clogged. Janitrol advises use of steel fittings. These cracked, corroded and clogged fittings were aluminum.

The manufacturer is installing steel fittings in production aircraft and is providing retrofit information for in service aircraft.

NOTE: Similar article on page 2 of Alert No. 38, September 1981.

| | | |
|---|---|---|
| Beech<br>Model 95-B55 | Wing Attach Bolt | A report has been received of a badly corroded left wing upper forward attach bolt. The corrosion is attributed to an accumulation of moisture around the bolt. |

## CESSNA

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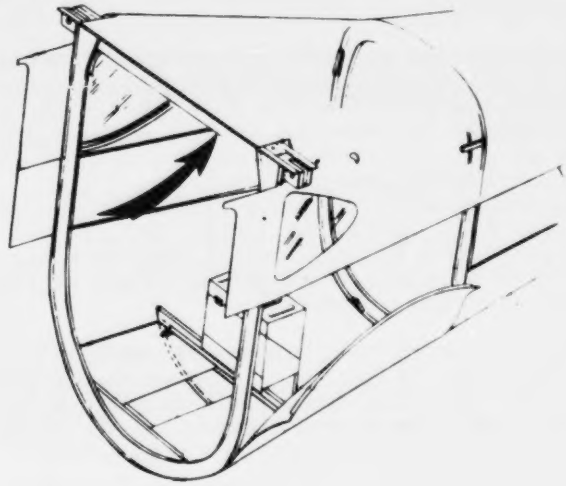
Cessna
Models 120, 140
150 (over 10 yrs old)
and 170 Series

**Fuselage Front and Rear Spar Assembly**



There have been several reports of corrosion in the fuselage front and rear spar wing carry-thru structure. It is recommended that the hat section be checked at every annual inspection. The following procedure is suggested to facilitate this inspection. The Cessna Aircraft Company concurs with this procedure.

1. Remove either wing, remove the spar bearing block. Inspect interior of hat section for corrosion or other discrepancies.

OR

2. Drill 1/2-inch holes in the cabin top skin on 7-inch centers along the center line of the hat section. The first hole should be on the fuselage centerline. Do not drill holes in the area of the spar bearing blocks. After completion of the inspection, smooth edges of holes and apply protective coating. Close the holes with grommets, fabric patches, or other suitable methods.

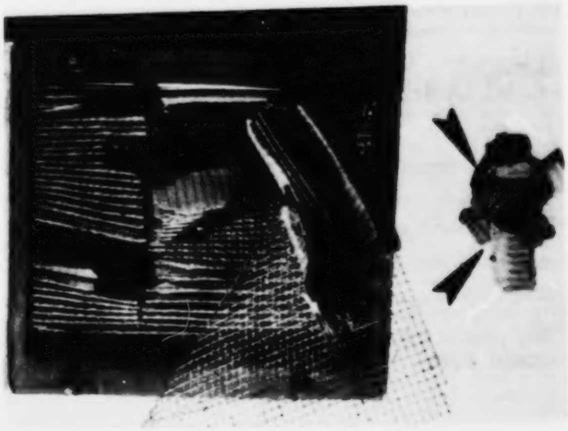
NOTE: If holes are drilled into the spar channel, reinforce the channel to provide equivalent strength.

---

Cessna
Model 172L

**Induction Air Filter**

The carburetor induction air filter was found deteriorated during an annual inspection. The filtering material had completely deteriorated and the downstream screen mesh was broken loose from the frame. The material denoted by the arrows had lodged in the carburetor venturi throat area. The Service Manual for the 172 series aircraft suggest the filter be removed, inspected and cleaned at least every 100 hours of engine operating time and more frequently if warranted by operating conditions.



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Cessna
Model 182Q

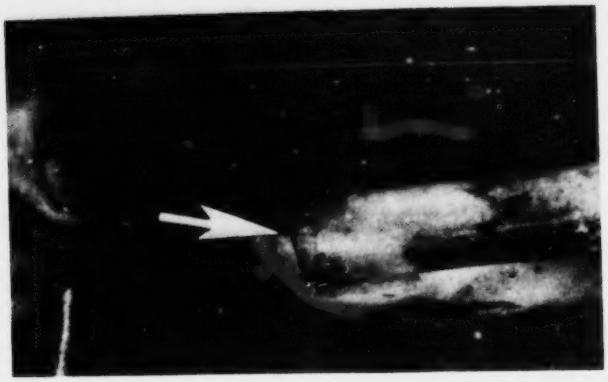
**Cut Fuel Line**

The interior trim was removed at the left forward door post during a 100 hour inspection. Removal of the trim revealed the fuel line wall had been cut over half way through by action of the aileron cable.

---

A MINUTE FOR SAFETY IS BETTER THAN A MONTH FOR REPAIRS

| | | |
|---|---|---|
| Cessna<br>Models R172K<br>(Hawk XP), 180, 182,<br>185 and 188 Series | Engine Mount | There is a continuing problem with corrosion on those portions of the engine mounts which are exposed to heat from adjacent exhaust stacks. Cessna has issued Single-Engine Service Letter No. SE76-22, dated November 15, 1976, which suggests that a very high temperature enamel be applied to the areas of the engine mounts which are in close proximity to the exhaust stacks. This enamel is identified by Cessna P/N CES1054-812S.<br>Although the service letter specifically mentions the Model A185 and A188 series airplanes with the 300 hp engine, it is recommended the enamel be used on any airplane where corrosion of the engine mounts is accelerated by elevated temperatures.<br>Cessna Single-Engine Service Letter SE78-27 was issued on April 24, 1978, to provide instructions for the use of the very high temperature enamel on the engine mounts of the Hawk XP series airplanes.<br>The above article was previously published in Alert's No. 22 May 1980. The mount in the picture was from a Cessna A185F with 200 hours total time. Cracks were found across the welds on both the left and right forward mount areas. |



## CONSOLIDATED AERONAUTICS

| | | |
|---|---|---|
| Lake<br>Model LA-4-200 | Air Intake Gasket | The pilot turned on the turbocharger at 4,000 feet and the engine lost power. An after landing investigation disclosed the alternate air door gasket had come off and was blocking the turbocharger intake. |

## ENSTROM

| | | |
|---|---|---|
| Enstrom<br>Model F28A | Damper Rod End | Unapproved main rotor damper rod ends were found on two Enstrom F28A helicopters. The rod ends had been ordered from Heim and were identified as HM-8. The rod ends had a brass bushing instead of steel. The correct part number as listed in Enstrom Manual is 01-691-08. |

## GATES LEARJET

| | | |
|---|---|---|
| Gates Learjet<br>Model 24 | Torque Plate Assembly<br>P/N 9543462 | It has been reported that the torque plate on the brake assembly can be easily installed in a reverse position. Installing the torque plate incorrectly causes the brake housing to crack with possible total failure. Design of the torque plate contributes to the plate being installed incorrectly. |

Gates Learjet
Model 25D

Emergency Window

During an interior inspection of the aircraft, it was found that the emergency window could not be removed because of interference from the cabin headliner. The headliner was reworked in the area of the emergency window and the window could then be removed.

---

## GULFSTREAM AMERICAN

Gulfstream American
Rockwell
Model 112TC

Throttle Rod End

The rod end at the carburetor was found worn and loose during an annual inspection. This condition may have existed for some time as there had been complaints of the throttle being tight. Part total time - 500 hours.

Gulfstream American
Rockwell
Model 500-B

Strut Needle Bearings

While performing a gear retraction test, the right gear made a grinding noise as the lower gear fork rotated to fit into the gear well. When the gear was removed and disassembled, the upper needle bearings in the strut housing were found completely disintegrated. Aircraft time - 1,900 hours.

Gulfstream
Models G-1159
and G-1159A

Flap Asymmetry System

Some operators may have modified the flap asymmetry system to bypass the protection system. These modifications may not be in compliance with the certification basis specified in Type Data Sheet A12EA. If the modification is not FAA approved, the airplane should be returned to an approved configuration. Otherwise the airplane certificate and operator are subject to enforcement action. Gulfstream American Customer Bulletin No. 315, dated August 21, 1981, requires an inspection of the subject system and the removal of any means for overriding the protection system. Recognizing the factors involved with abnormal flap operation, Gulfstream American will undertake an evaluation of an acceptable means to permit flap operation if the flap asymmetry protection system should malfunction.

---

## LET

Let
Model L-13
"Blanik"

Frayed Cable

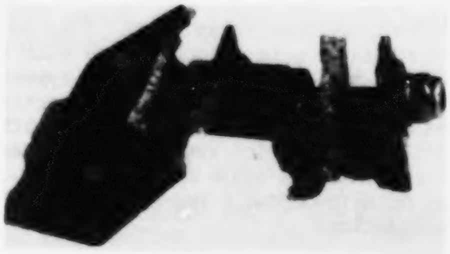
The left rudder cable was found frayed and broken at the rudder bellcrank. The location precludes inspection with the rudder in place. The rudder pivot bolts must be loosened and the rudder lifted up to see the cables. This aircraft had flown 98 hours since the last inspection and had 622 hours total time.

NO INVESTMENT PAYS BETTER DIVIDENDS THAN SAFETY.

## MITSUBISHI

| | | |
|---|---|---|
| Mitsubishi<br>Model MU-2B-35 | Flap Rod Bearing | Noise was observed in the shaft/gearbox area during a 100 inspection and while complying with Airworthiness Directive 74-11-02 - Flap Flexshaft. The noise was traced to scored ball bearings on the right flap center actuating rod bearing. Aircraft total time - 3,200 hours. |

## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-23-250 | Drag Link Bolt | The right main landing gear collapsed during a moderate speed run on the runway. An investigation revealed the main landing gear drag link bolt had failed. Further investigation revealed the failed bolt was a AN7-27 instead of a AN177-27 as listed in the Piper parts manual. The left main landing gear was inspected and a cracked AN7-27 bolt was found. |
| Piper<br>Model PA-23-250 | Fuel Vent Lines<br>P/N 31008-00 and -01<br>31007-00 and -01 | The fuel tanks were overfilled and later fuel was observed dripping from the wheel well areas. An investigation revealed all four fuel tank vent lines were ruptured approximately 1 1/2 inches lengthwise at the low point area. Ruptured lines apparentely caused by water freezing and expanding in the low areas of the vent lines. |
| Piper<br>Model PA-28R-200 | Retract Fitting<br>P/N 67031-02 |  |

The left main gear indicated unsafe when the gear was extended for landing. The gear was recycled several times with the same results. The left gear collapsed during the landing roll. An investigation disclosed the left gear retract fitting was broken. Cause or contributing factors unknown. Aircraft time - 3,654 hours.

| | | |
|---|---|---|
| Piper<br>Model PA-31T | Elevator Torque<br>Tube Bearing | During compliance with Piper Service Bulletin No. 715 - Elevator Torque Tube Inspection, the lower bellcrank spherical bearing was found extremly worn. The play in the bearing was allowing the torque tube to rub against the right side of the bellcrank. The pilot had reported excessive play and a "squeaking" noise heard during preflight of the elevators. Aircraft total time - 988 hours. A similar condition was found on another PA-31T with 707 hours total time. |

WHEN IN DOUBT, DON'T

Piper
Model PA-32R-300

Rod End Bearing

During compliance with Airworthiness Directive 80-14-02, the throttle cable ball end was found worn and falling apart. Part total time - 947 hours.

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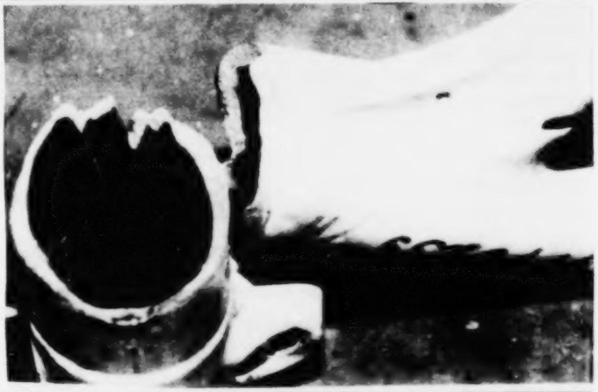
Piper
Model PA-34-200T

Main Gear Casting
P/N 67926-08



There were indications of previous cracks in the pictured broken right main gear casting. The left main casting also showed signs of cracks on the aft side. Total aircraft time - 1,791 hours.

---

Piper
Model PA-34-220T

Gear Selector
Switch

The left main and the nose gear retracted on landing roll. An investigation revealed the gear selector switch in the right wheel well shorted on the right engine fuel pressure line. This short caused the landing gear motor to operate momentarily when the aircraft hit a hump on the runway which sent a signal to the squat switch. Several other aircraft were checked and the clearance between the fuel line and the selector switch was approximately 3/8 inch. Piper Service Bulletin No. 732 pertains to the subject.

---

Piper
Aerostar
Model 600A

Alternate Air Door

Restricted throttle movement prevented reducing RPM below 1800 on number 1 engine. The mixture control was used to shut down the engine. An investigation revealed the alternate air door was missing and had jammed near the throttle body preventing normal throttle movement. The four rivets attaching the door to the hinge had pulled through the door skin and remained with the hinge. The hinge pin was found partially out of both engine alternate air doors. Total aircraft time - 85 hours. There have been 11 reports of alternate air door problems within the past 2 years. Eight of the reports were received in the past 2 1/2 months.

---

## SWEARINGEN

Swearingen
Model SA226 Series

Main Landing Gear
Door System

There have been several reports of incidents related to the landing gear system. Swearingen Aviation Corporation issued Service Bulletin 32-026 on October 16, 1980. The reason for the Bulletin was to reduce the possibility of landing gear malfunction due to misrigging of the door system. Compliance with SB 32-026 was recommended by Swearingen Aviation Corporation.

## VARGA

| | | |
|---|---|---|
| Varga (Morrisey)<br>Model 2150A | Cracked Ribs | The outboard center section ribs were found cracked at the bottom bolt where the ribs attach to the rear face of the rear center section spar. It was reported that the nut and washer rides on the rib bend radius causing the metal to crack when the bolts are tightened. |

# EQUIPMENT

## PACIFIC SCIENTIFIC

| | | |
|---|---|---|
| Pacific Scientific<br>Shoulder Harness | Rotary Buckle<br>P/N 1101550 | A refurbished shoulder harness/safety belt, assembly was found in which shoulder harness strap connector links (P/N 1101211) were installed on the lap belt strap rather then the correct lap strap connector link (P/N 1101212). Though the links will fit into the rotary buckle with this incorrect installation, they will not function properly, so care should be taken to use the correct part number link. |

## ROCKWELL INTERNATIONAL

Collins General Aviation Division - Emergency Locator Transmitter (ELT) CIR-11-()

Maintenance personnel can be of assistance to their customer and other owners and operators by passing along the following information:
As a result of a recent NTSB recommendation, the FAA is requesting owners of the ELT to obtain and retain an updated owner's manual, Document No. 950012 dated March 20, 1981, for use in the installation and operation of the units. The updated owner's manual includes information which concerns the remote reset feature. In this section, owners are advised that the ELT is only ARMED if the function switch on the ELT is set to "ARM" and that the remote ON test does not verify that the ELT is armed. The ELT must be visually checked to ensure the function switch is in the "ARM" position.

# ACCESSORIES

## BENDIX

| | | |
|---|---|---|
| Bendix<br>Magneto<br>Model 20 Series | Impulse Coupling | During inspection of a impulse coupling received from a supplier, the impulse flyweight securing washer was found loose on the cam. Bendix Overhaul Instruction Manual for Model S20 magnetos states, "Grip washer with pliers and exert moderate turning force. If washer moves or cracks are found, reject cam assembly." Two impulse couplings were found in this condition. |

## B R A C K E T T

| | | |
|---|---|---|
| Brackett<br>Model BA6110 | Air Filter | A power loss was experienced during cruise in a Mooney STC M20 at 10,000 feet in IFR conditions. After an emergency landing, the plastic foam of the engine air induction filter was found saturated with water and frozen. The pilot removed and thawed the filter and reported wringing a cup of water out of the foam filter. Carburetor heat had been applied during most of the flight. |

## C O N T I N E N T A L

| | | |
|---|---|---|
| Teledyne Continental | Oil Filter<br>P/N 643226 | One operator had three oil filters leak after initial installation. Investigation of the filters revealed cracks at the spot welds on the filter base. A sample inspection of five filters from stock disclosed cracks at the welds. |

## S L I C K

| | |
|---|---|
| Slick<br>Magneto<br>Model 662 | Mounting Flange |

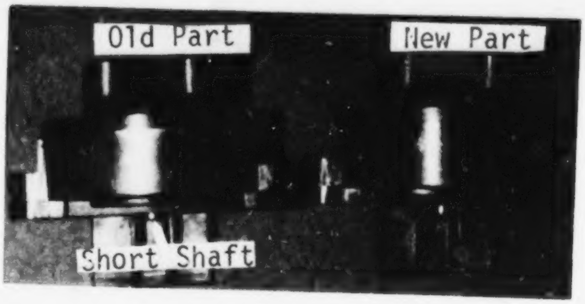
The flange broke at 130 hours total time. Cause unknown.

| | | |
|---|---|---|
| Slick<br>Magneto<br>Model 4201R | Coil<br>P/N M3114 | Numerous reports have been received recently stating that Airworthiness Directive 81-16-05 was being complied with and the coil potting material was found to be cracked. Some cracked coils were functioning properly at the time of the inspection while some showed signs of arcing. A few magnetoswere reported not to be applicable to the AD, yet the coil covering was found cracked. Also, the date of manufacture of some cracked coils did not fall into the ranges listed in the AD. |

In order to ensure continued receipt of the "Alerts," an address change must be reported to the FAA district office under which you exercise your certificate.

Slick
Magneto
Model 4201

Distributor Gear



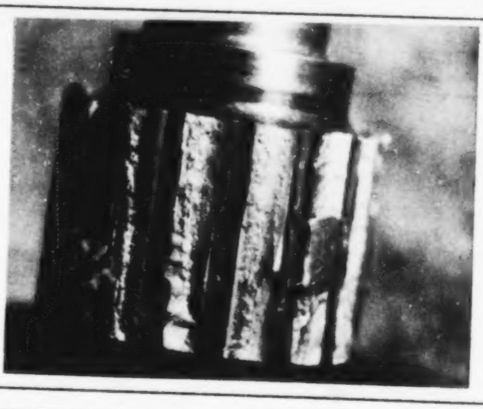
The magneto was inspected in accordance with Airworthiness Directive 81-16-05. The coil was not cracked but the coil high voltage lead was found extensively worn by the distributor gear carbon electrode. Also, the carbon electrode was almost completely worn away. The distributor gear shaft containing the carbon electrode was found to measure approximately 1/16 inch shorter than the new part. The high voltage lead did not press firmly against the carbon electrode which resulted in rapid wear of the electrode. This condition was discovered before the magneto malfunctioned. Magneto total time - 192 hours.

## ENGINES

### CONTINENTAL

Continental
Model GTSIO-520-L

Starter Shaft Gear
P/N 631847



The adapter was removed because the starter would motor, the torsional damper would rotate, but the engine would not crank. All the teeth were found broken off where the shaft gear engages the crankshaft gear. The crankshaft gear teeth were damaged but none broken. Total time since major overhaul - 374 hours.

## PROPELLERS

### HARTZELL

Hartzell
Model HC-E3YR-2AF

Attach Studs
P/N A-2067

The aircraft aborted the takeoff roll and returned to the ramp. Four of the six propeller attach studs were found broken. Lab analysis disclosed the studs did not meet Hartzell specifications.

Advisory Circular 91-13C, provides background and guidelines relating to operation of aircraft in the colder climates where wide temperature changes can occur.

## OF INTEREST

### ROTATING PROPELLER AND HELICOPTER ROTOR BLADES

Most of this article consists of excerpts from Advisory Circular 91-42C - Hazards of Rotating Propeller and Helicopter Rotor Blades and from Advisory Circular 91-32A - Safety In and Around Helicopters.

There were a total of 53 propeller and rotor-to-person accidents for the years 1977, 1978 and 1979. (There have been approximately 30 additional reports since 1979). Of the 53 reported accidents during 1977, 1978, and 1979, five were the result of helicopter rotors which caused two fatal and three serious injuries. The 48 propeller accidents caused 15 fatalities and 33 serious injuries.

It is particularly tragic that propeller and rotor-to-person accidents have included, along with airmen, bystanders, passengers, and children among the injured persons. Propeller and rotor-to-person accidents differ from other aircraft accidents in that they usually result in fatal or serious injury. This is due to the fact that a propeller or rotor rotating under power, even at slow idling speed, has sufficient force to inflict serious injury. It should be remembered that a rotating propeller or rotor is extremely dangerous and should be treated with all due caution.

The propeller or rotor is difficult to see when in operation, and the nonprofessional public is often not aware of its danger. Even personnel familiar with the danger of a turning propeller or rotor may become complacent.

Some manufacturers of propeller and rotor blades use paint schemes to increase the conspicuity of the blades. Owners should give strong consideration to maintaining the conspicuity paint scheme of the original manufacturer.

In August of 1978, the FAA issued Report No. FAA-AM-78-29, Conspicuity Assessment of Selected Propeller and Tail Rotor Paint Schemes. The report summarizes the evaluation of three paint schemes for airplane propellers and two for helicopter tail rotor blades. The document is available to the public through the National Technical Information Service, Springfield, Virginia 22161.

With proper education and discipline propeller and rotor-to-person accidents can be reduced-hopefully to zero.

The following safety measures should be considered to help prevent these tragic accidents. Non-flight crew personnel directly involved with boarding or deplaning passengers and aircraft servicing should be instructed as to their specific duties through proper training, with emphasis placed on the dangers of rotating propellers and rotors. Ramp attendants and passenger-handling personnel should be made aware of the proper procedures and methods of directing passengers to and from parked aircraft. When the possibility of passengers wandering on the ramp exists, physical barriers should be provided such as rope-stanchions from the aircraft to the terminal doors.

Airport management personnel should be on the alert to keep unauthorized persons from milling around on ramps among parked aircraft. When spectators are permitted to view and move along aircraft parked on a ramp, the airport management personnel should caution those persons to stay clear of all propellers and not touch or move them.

Helicopter landing and ramp areas should be marked and provided with safety barriers to restrict access by unauthorized persons.

Tail rotor danger areas should be clearly marked on ramp areas. Helicopters should be parked with tail rotors within the marked area.

Aircraft service personnel directly involved with aircraft service are most vulnerable to injuries by propellers or rotors. Working around aircraft places them in most likely position for possible propeller or rotor accidents. Aircraft service personnel should develop the following safety habits:

Before moving a propeller or connecting an external power source to an aircraft, be sure that the aircraft is chocked, ignition switches are in the "OFF" position, throttle is closed, mixture is in "idle cut-off" position, and all equipment and personnel are clear of the propeller or rotor. Faulty diodes in aircraft electrical systems have caused starters to engage when external power was applied regardless of the switch position.

When removing an external power source from an aircraft, keep the equipment and yourself clear of the propeller or rotor.

Always stand clear of rotor and propeller blade paths, especially when moving the propeller. Particular caution should be practiced around warm engines.

Attach pull ropes to pull chocks from wheels close to rotating propeller or rotor blades.

Before removing chocks, signal pilot to hold brakes or apply parking brake.

Be sure all equipment and personnel are clear of an aircraft before giving the pilot the signal to depart.

Ground personnel should be given recurrent propeller and rotor safety lectures to keep them alert to dangers when working around helicopters and fixed-wing aircraft.

Flight personnel and flight instructors should make certain that all personnel are clear of the propeller or rotor, prior to engine start.

The engine of a fixed-wing aircraft or of a helicopter should be shut down before boarding or deplaning passengers. This is the simplest method of avoiding accidents.

Boarding or deplaning of passengers, with an engine running, should only be allowed under close supervision. The pilot in command should have knowledge that either the company or the airport operator has ground attendants fully trained in their specific duties to board or deplane passengers from an aircraft with engine(s) running. The pilot should instruct passengers, before they exit an aircraft with engine(s) running, the path to follow to avoid the propeller or rotor blades.

When flight and ground instructors are instructing their students about propellers or rotors, they should emphasize the dangers of rotating propeller and rotor blades. Students should be taught the technique and safety procedures for handcranking, and how to determine which engines should not be handcranked. Safety through education is the best and most positive means available for reducing potential accidents from rotating propeller and rotor blades.

The prestart portion of the checklist should include an item to make sure the propeller or rotor blades are clear. The proper use of the aircraft checklist should be taught to all student pilots.

Flight personnel should perform an ignition switch test prior to engine shutdown to detect faulty switches. The checklist should include an item for that test to be made and an item to assure that the switch is "OFF" before leaving the cockpit.

SUMMARY.

a. In reviewing propeller-and rotor-to-person accidents, the most impressive fact is that every one of them was preventable. The danger of rotating propeller or rotor blades is universally recognized.

b. The pilot can be most effective in ensuring that his or her passengers arrive and depart the vicinity of the airplane safely by stopping the engine completely at the time of loading and unloading, or by providing a definite means of keeping them clear of the propeller if it is left in motion.

c. Prominent warning signs, placed in the aircraft's interior near or on the inside face of the aircraft doors to alert passengers and crewmembers of propeller or rotor hazards, could be helpful in preventing accidents.

NOTE: The listed Advisory Circulars may be obtained from:

U. S. Department of Transportation
Publications Section M-443.1
Washington, DC 20590

## MAINTENANCE NOTE

### USE PROPER PART

The right propeller on a Beech 95B55 feathered during cruise flight. The pilot observed oil on the engine cowling and did not restart the engine. The aircraft was landed without further incident. During spinner removal, the propeller fell to the ground. All the attach bolts were found broken at the bolt heads. An investigation revealed a oversize "O" ring shaft seal had been installed. The oversize seal prevented the propeller from seating flush on the mounting flange which allowed the propeller bolts to work.

## CAUTION

### AUTOMATIC PARACHUTE OPENER

Caution should be exercised when installing the FXC Corporation Model 12000 automatic parachute opener on a Greenstar Trac II dual back pack parachute. It has been reported that when the opener is installed per typical installation instructions supplied by the manufacturer, the opener will not release both retaining pins due to the position of the automatic rip cord housing.

### HANDCRANKING AIRCRAFT ENGINES

There were 46 reports of incidents and accidents, some of which resulted in serious injuries and fatalities, related to the aircraft engine starting when the propeller was pulled through by hand. These 46 reports were received over a 34 month period.

Many different aircraft were involved - Aeroncas, Beech-single and twin, Cessna-single and twin, Gulfstream American, Mooney, Piper, Ryan, Taylorcraft and others.

The following excerpts from some reports are typical of most:

The aircraft would not start with the starter. Engine started when propeller pulled through by hand. No chocks - no brakes - no one at controls. Aircraft collided with another aircraft.

Pilot attempted to clear flooded engine by backing the propeller by hand. Engine fired resulting in multiple fractures and lacerations. The magneto switch was left in "ON" position.

The battery was low so the pilot hand propped the engine. Engine fired. Aircraft hit nearby building. No chocks - brakes off.

It was cold and the battery would not turn the engine. The pilot was going to pull the engine through a few times because of congealed oil. Engine fired resulting in serious injuries. Ignition switch found in "ON" position.

Pilot hand propped the engine due to starter or battery problems. After engine start the tie down ropes broke and the aircraft struck a parked aircraft.

Many of the reports were of one pilot operation - no one in the aircraft when hand propping occurred. Other reports were of non pilot personnel in the aircraft unfamiliar with stopping the engine or applying brakes.

There are also reports of aircraft becoming airborne - unoccupied after hand propping the engine.

Cold weather contributes to congealed oil, low battery power and slow starter operation. If the engine does not start normally and movement of the propeller is attempted - please consider the following:

- Treat all propellers as though the ignition switches are "ON".
- Use wheel chocks, parking brakes, or aircraft secured by tie down means.
- Allow only experienced persons to pull the propeller through by hand.
- Have a reliable person - familiar with engine and aircraft operation in the cockpit.
- Be alert and exercise caution during this procedure.

Cold weather - heavy bulky clothing which may limit mobility - restricted visibility - hurry up, get out of the cold - all contribute to incidents and accidents. Please be aware and take care.

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## ALERT NO. 43

## FEBRUARY 1982

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Flight Standards National Field Office

TD 4.414:

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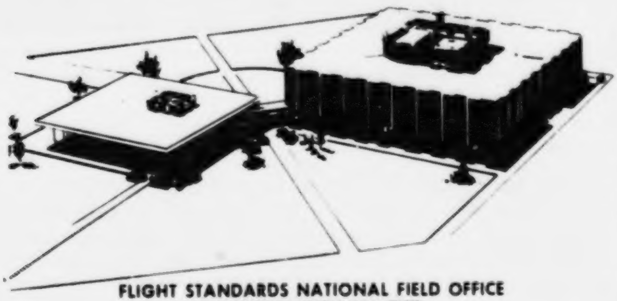
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

ADVISORY CIRCULAR
AC 43-16

# GENERAL AVIATION AIRWORTHINESS ALERTS

FEBRUARY 1982



FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

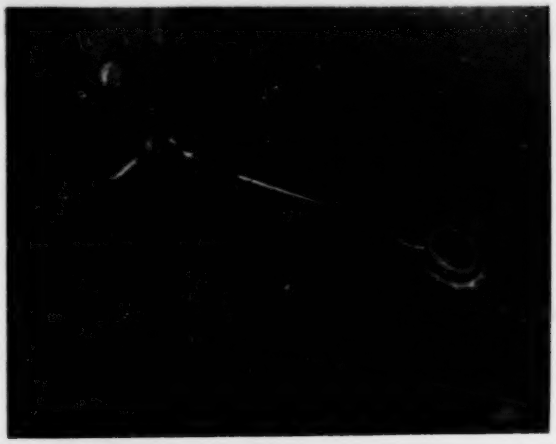
### BEECH

| | | |
|---|---|---|
| Beech<br>Model V35B | Landing Gear Motor | The in-transit light remained illuminated and the gear was fully extended by the emergency method. An investigation revealed low power output from the landing gear motor. The motor appeared satisfactory for continued use by visual inspection. Records indicate this was the original motor with 1,715 hours of aircraft time. Beech recommends motor replacement at 1,000 hours. |
| Beech<br>Model B60 | Nose Steering Bellcrank | The tangs on the nose wheel steering bellcrank assembly were bent which caused interference with the nose gear cam assembly and prevented full extension of the nose landing gear. Possible cause for the bent tangs was exceeding the tow limits on the nose gear assembly. |

**Beech**
**Model 65-A90**

Stabilizer Spar

The aircraft had encountered severe turbulence during flight. An inspection revealed a cracked spar and spar cap at the outboard stabilizer attach bolt holes. No unusual exterior skin wrinkling or damage was apparent. Submitter suggests the tail cone be removed for all turbulence inspections. Airworthiness Directive 77-22-01 pertains to the area.



## C E S S N A

**Cessna**
**Model 140**

Frayed Cable

The up elevator cable was found rusted and frayed where the cable passes through the vertical fin and attaches to the elevator horn. The area is difficult to see during routine inspections.

**Cessna**
**Model 152**

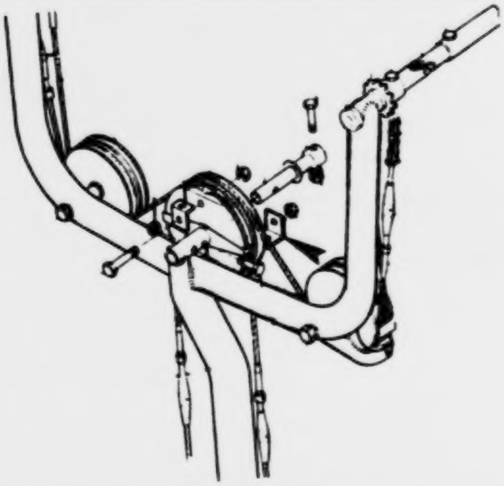
Beacon Bulb
P/N C 17312-1 and -3

It was reported that compliance with Cessna Service Letter SE80-53 does not solve the vibration problem and flashing beacon bulb filament breakage. There are many reports of low time bulb failures.

**Cessna**
**Model 172N**

Clamp
P/N 0511786-2

During a hard left turn, the aileron control advanced beyond the normal stop. An investigation disclosed that when the control wheel was turned full left or right (normal rotation 90 degrees), the double shank ball end on the primary aileron control cable slipped out from under the clamp and allowed the wheel to rotate approximately 180 degrees. Some resistance was felt when returning the wheel back to normal position. Aircraft time - 585 hours.



**Cessna**
**Model 177**

Bracket Assembly
P/N 1713208-1

The two upper ears on the control tube bracket were broken. This allowed the tube to move freely in the panel cut-out and the tube collar would strike the fuel gauge when the control was positioned to full nose up. Gust lock pressure in high wind conditions may have contributed to the broken ears. Aircraft time - 1,150 hours.

| | | |
|---|---|---|
| Cessna<br>Model 414A | Engine Mount Beams | The engine mount beams on two Cessna 414A aircraft were checked in accordance with Airworthiness Directive 81-11-05. There were no cracks when inspected visually. Penetrant inspection revealed cracks in the outboard beams of all four engines. The cracks ran parallel to the beams. Aircraft time - 975 and 1,107 hours. |

## EMBRAER

| | | |
|---|---|---|
| Embraer<br>Model EMB-110P1 | Auto Feather Switch | During runup prior to flight, the high pressure auto feather switch shorted rendering the systems inoperative. The armed indications were that the system was functioning normally. The shorted switch is located just forward of the right exhaust stack mounting flange and apparently exhaust gas loss overheats the switch. There have been 13 reports of problems with this switch. Submitter recommends installing a baffle between the switch and the exhaust stack. |
| Embraer<br>Model EMB-110P1 | Inlet Deicer Boot | There have been many reports of inoperative lower cowling deicers because of broken wires where 3 wires from the cannon plug meet one wire for the inlet boot. Engine/cowling vibration may be contributing to the problem. |

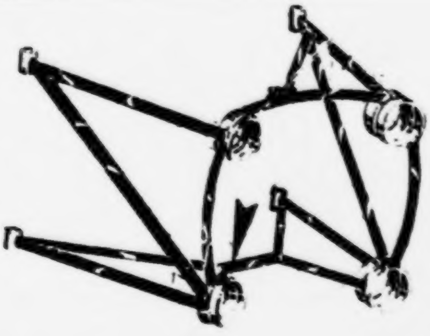
## GATES LEARJET

| | | |
|---|---|---|
| Gates Learjet | Aileron Bearings | The ailerons were reported very stiff above 14,000 feet altitude. An investigation revealed one bearing was completely seized and one other bearing was rough. The other two bearings operated normally at ambient temperature. Aircraft time - 3,108 hours. |

## GULFSTREAM AMERICAN

| | |
|---|---|
| Gulfstream American<br>Model AA-5B | Engine Mount |

The engine mount was found broken at the right end of the lower crossover tube during a 100 hour inspection. This was the second mount the operator has found broken at the same location in the crossover tube. Total time on the reported mount - 3,123 hours.



| | | |
|---|---|---|
| Gulfstream American<br>Model GA-7 | Fuel Tank Leaks | It has been reported that the sealant used around the fuel tank access panels on the GA-7 Model Aircraft (Products Research & Chemical Corporation Type PR 1321) has been chemically decomposing into a fine pink powder in the presence of 100 octane low-lead fuel resulting in fuel leaks and the accumulation of the powder onto the interior surface of the fuel tank. It is also reported that Products Research & Chemical Corporation now recommends using PR 1422 Class B sealant for this use. This condition is likely to occur on other aircraft models using this sealant (PR 1321) in contact with 100 octane low-lead fuel. |
| Gulfstream American<br>Model 690B | Nose Gear Actuator | The nose gear collapsed as the aircraft was being backed into a hangar. An investigation revealed only two threads had been engaged on the actuating cylinder rod end. The threads stripped which allowed the gear to fold. |
| Gulfstream American<br>Model 695 | Elevator Tube<br>P/N 530166-501 | The co-pilots left forward control column elevator push rod tube was found cracked at the forward and aft ends. Total aircraft time - 100 hours. |

## HUGHES

| | | |
|---|---|---|
| Hughes<br>Model 269C | Idler Pulley | There were two recent reports of finding the idler pulley sleeves badly worn. Aircraft times were 850 and 1,220 hours. |

## ISRAEL AIRCRAFT

| | | |
|---|---|---|
| Israel<br>Model 1124 | Fuel Transfer Valve<br>Cable Assembly | The right fuel transfer valve circuit breaker tripped. An investigation revealed a shorted electrical harness inside the right lower fuselage fuel tank. The male pin on the valve appeared to have been bent prior to connecting the cannon plug during original installation. The cannon plug was then force fitted which further bent the male pin driving it between the rubber insulator and the outside of the female pin on the cannon plug of the electrical harness. The male pin broke from the stress induced by not properly mating the female pin on the cannon plug. After the pin had broken, it shorted out against the case of the fuel valve causing the circuit breaker to trip. Aircraft time - 1,011 hours. |

Israel
Model 1124

Valve Plate

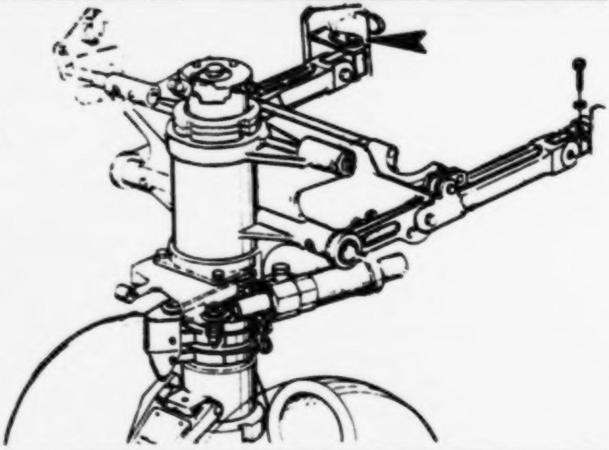
The duct over pressure/over temperature light would illuminate during takeoff and there were cabin pressure fluctuations. The light would extinguish when power was reduced. The valves were switched during trouble shooting and the light would illuminate and remain on. During replacement of the left bleed switching valve, the valve plate was found down stream jammed in the duct restrictor. The retaining screw had backed out of the plate. Aircraft time - 985 hours.

## MITSUBISHI

Mitsubishi
Model MU-2B-40

Broken Bolt
P/N 037A-39107

The bolt in the right side nose gear drag strut was found broken on two separate aircraft. Time on reported aircraft - 834 hours.

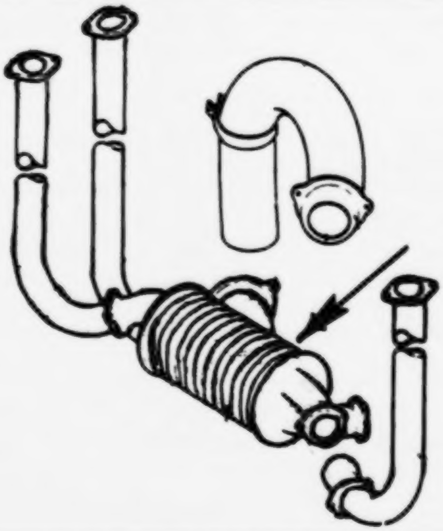


## MOONEY

Mooney
Model M20F

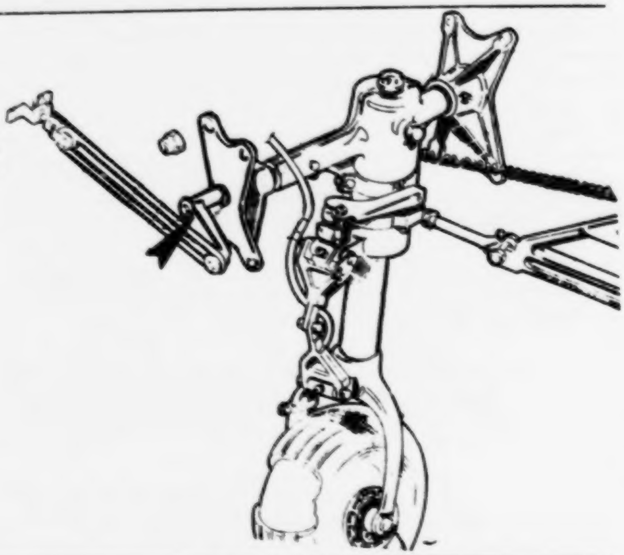
Cracked Muffler

The aircraft made an unscheduled landing because of fumes in the cockpit. An investigation disclosed the muffler was burned and both ends were cracked. A portion of the end plate was completely missing from one end. Part total time - 1,932 hours.



Accidents where improperly loaded aircraft - weight and/or center of gravity was cited as a cause factor - 1970 - 37 accidents with 75 fatalities.

## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-16 | Fuel Selector | The cotter pin securing the fuel selector handle to the fuel selector valve wore to the point of failure. This allowed the selector handle to become disengaged from the valve. Changing fuel tanks could not be accomplished which resulted in engine stoppage and an off airport landing. |
| Piper<br>Model PA-24-250 | Bungee Arm<br>P/N 20846 | Both main gear bungee arm assemblies were found cracked and broken. Wear and hard landings may have contributed to the problem. Aircraft time - 2,800 hours.<br> |
| Piper<br>Model PA-24-250 | Spring<br>P/N 83302-39 | The landing gear circuit breaker tripped during gear retraction after takeoff. The circuit breaker tripped again after reset and the landing gear remained in a partially retracted position. Attempts to extend the landing gear manually were unsuccessful and the aircraft was landed with the gear in an intermediate position. An investigation disclosed the landing gear actuator jackscrew balance spring was not connected to the actuator. This allowed the jackscrew end of the actuator to drop down and jam into the aircraft structure which prevented extension of the landing gear by the emergency method. The spring was connected to the attach point on the bottom side of the cockpit floor and the spring appeared to be stretched. The dynamic brake was found loose on it's mounting and the landing gear slide tubes were dirty which may have contributed to the initial problem of circuit breaker tripping. |
| Piper<br>Model PA-31-325 | Down Lock Fork<br>P/N 41789-00 | The left main gear did not indicate down and locked. An investigation revealed the fork was too tight which would not allow the fork to swivel. This resulted in the down lock rod and hook to be very stiff and binding. Proper torque was applied to the fork retaining nut, the system was lubricated, and the problem was corrected. |

| | | |
|---|---|---|
| Piper<br>Model PA-32-300 | Wheel Axle<br>P/N 63305-4 | The right main gear wheel axle was found bent. The bend was 1 1/2 inches out from the brake torque plate flange at the sleeve radius. The left gear axle had broken previously in the same area. The aircraft is operated on rough terrain. Aircraft time - 5,650 hours. |
| Piper<br>Model PA-34-200T | Rudder Control Cable<br>P/N 62701-72 | The rudder was observed moving freely with the wind while the aircraft was parked. An investigation revealed the cable was severly frayed and had broken. The cable had been routed over the cable guard pin at F.S. 285.84. There had been no reported problems regarding rudder operation. Aircraft time - 190 hours. |
| Piper<br>Model PA-44-180 | Carburetor Air Box<br>P/N 86245-21 | There have been three recent reports of finding the carburetor air box cracked at the carburetor mounting bolt holes. Part times were - 90,92 and 192 hours. |
| Piper<br>Model 601P | Nose Gear Bolt<br>P/N NAS 464-4 | The nose gear steering cylinder attach bolt broke. There were indications of a fatigue crack prior to breaking. Probable cause was exceeding turning limits during towing operations. Aircraft time - 907 hours. |
| Piper<br>Model 602P | Turbocharger<br>Cross Shaft<br>P/N 300035-519 | The rod end and bearing block was found worn due to lack of lubrication. Excessive heat from the exhaust system contributed to the problem. Aircraft time - 341 hours. |
| Piper<br>Model 602P | Turbocharger<br>Oil Line | The turbocharger oil return lines were found deteriorating and damaged due to excessive heat from the exhaust system. Submitter advises that a heat shield in the area would help prevent this condition. |

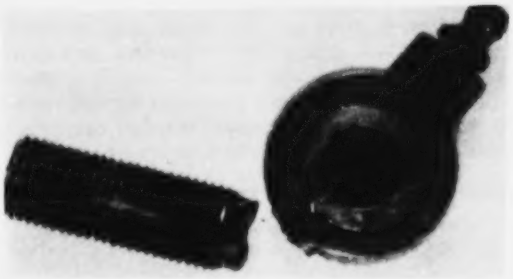
## RAVEN

| | | |
|---|---|---|
| Raven<br>Model S-55A | Pressure Gauge | Flames came out between the glass and the housing of the flush mounted propane pressure gauge. An investigation disclosed the solder had melted on the bourdon tube. Further investigation revealed a hydraulic pressure gauge was being used in lieu of a LPG pressure gauge. |

## ROCKWELL INTERNATIONAL

**Rockwell**
**Model NA-265-80**

**Broken/Cracked**
**Actuator Rod Ends**
**P/N 265-580165**



Twenty main landing gear actuator rod ends were found cracked on one operators fleet of NA-265-40 and -80 aircraft. The cracked rod ends were found during a fleet inspection after rod end breakage during flight. This same part number rod end may be applicable to other NA-265 aircraft.

## SWEARINGEN

| | | |
|---|---|---|
| **Swearingen**<br>**Model SA226-TC** | Nose Gear Up-Lock | Emergency release of the nose gear was required to extend the gear. An investigation revealed the up-lock hook was binding. Gear operational check was normal after cleaning and lubricating the up-lock assembly. |
| **Swearingen**<br>**Model SA226-TC** | Overheat Sensor | There have been reports of the right wing overheat light flashing during flight. The flashing overheat lights was caused by moisture contamination of the generator overheat sensor in the right wing. Cleaning, drying and sealing the sensor eliminate the problem. |

## AIRFRAME COMPONENTS

## GOODYEAR

| | | |
|---|---|---|
| **Goodyear**<br>**Wheel** | Fuse Plug<br>P/N 9534552 | Six new Learjet wheels were found leaking around the fuse plugs. |

## ACCESSORIES

## BENDIX

| | | |
|---|---|---|
| **Bendix**<br>**Magneto**<br>**Model S6LN-25** | Worn Bushing | The distributor bushing was worn and brass filings were thrown around inside of the distributor block causing cross fire at altitude. This was the second time this has been found on a Mooney 231. Part total time - 364 hours. |

## BRACKETT

| | | |
|---|---|---|
| Brackett<br>Air Filter<br>Model BA-3 | Deteriorated Material | The sponge filter material came apart and filled the intake ports and carburetor with small particles. The pilot had complained of low power. Part total time was 80 hours and was installed in a Beech A23-19 under STC SA71GL. |

## MARVEL SCHEBLER

| | | |
|---|---|---|
| Marvel Schebler<br>Carburetor<br>Model MA-4-5 | Heavy Float | Fuel was observed running out of the bottom cowling after engine shut down. An investigation revealed fuel was leaking from the carburetor. The carburetor was disassembled and the float was found saturated with fuel. Fuel had been observed leaking from the cowling on two previous occasions. Part time - 461 hours. |

## PRESTOLITE

| | | |
|---|---|---|
| Prestolite<br>Alternator | Bearing Failure | An overhauled (by other than Prestolite) alternator was installed on a Cessna - 340A aircraft. The outboard bearing in the alternator failed at 14 hours of operation, causing damage to the engine ring gear. Emphasis should be placed on strict adherence to the manufacturers specifications during repair or overhaul. |
| Prestolite<br>Alternator | Broken Mounting | During a 100 hour inspection on a Cessna 340A aircraft, an oil leak was found at the left engine forward case half. During replacement of the alternator gasket the top aft alternator mount ear was found broken. The right engine alternator mount was also found broken at the same area. |

# ENGINES

## CONTINENTAL

| | | |
|---|---|---|
| Continental<br>Model IO-360-C | Cracked Case | A crack was found on the right top side of the crankcase half during a routine inspection. The crack started from the top forward cylinder hold down stud of the number 6 cylinder. The crack went vertically for 2 inches then turned aft 90 degrees for 7 inches. The engine had 810 hours total time and was installed in the aft position on a Cessna 337 airplane. |

Continental
Model TSIO-520-NB

Cracked Case

The case cracked at the number 4 through bolt hole. Both case halves were cracked down 2 inches and were leaking oil. These were reported as heavy cases and had 528 hours since new.

---

Continental
Model TSIO-520-E

Cylinder Assembly

The engine began running rough during cruise flight. The fuel boost pump was turned on which helped for a short period of time. A malfunction of the fuel metering system was suspected until the separated cylinder was found.

---

## LYCOMING

Lycoming
Model O-235-L2A

Dished Valves

An investigation of low cylinder compression revealed the intake and exhaust valves and valve seats were dished. Engine total time - 301 hours.

---

Lycoming
Model IO-540

Fuel Pump

High fuel flow was observed for the left engine on a Piper 601P during flight. An investigation revealed four saftied screws on the aft end of the engine driven fuel pump were loose enough to allow fuel to spray into the engine compartment. Apparently the pump gaskets had shrunk and caused the problem. Part total time - 630 hours.

---

Accidents where improperly loaded aircraft - weight and/or center of gravity was cited as a cause factor - 1975 - 46 accidents with 50 fatalites.

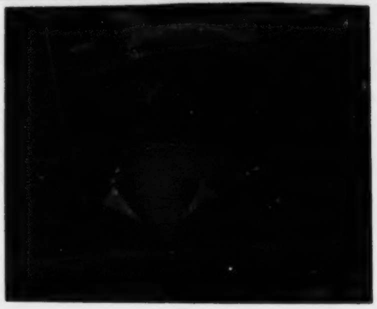
---

Accidents where improperly loaded aircraft - weight and/or center of gravity was cited as a cause factor - 1980 - 47 accidents with 50 fatalities.

# PROPELLERS

## HARTZELL

Hartzell Cracked Hub
Model BHC-J2YF-2



An operator of a Beech 58 observed grease leaking from the propeller hub. The propeller was disassembled for closer inspection of the hub for possible deformation. Dye penetrant of the hub revealed a crack approximately 1 1/2 inches through the bearing retention and around the outboard bolt boss. Part total time - 514 hours.

# WOULD YOU BELIEVE IT

### GREASE FITTING

One main landing gear would not lock in the down position. An investigation revealed the bushing in the lower end of the brace assembly had seized. Further investigation disclosed the grease zerk was not drilled completely through which prevented grease flow to the bushing. Aircraft total time - 304 hours.

# CAUTION

### TOO MUCH OF SOME GOOD THINGS CAN BE BAD

The weather was cold in January, and the airplane owner preheated his engine before attempting a start. In this case, a hot air blower was used, but too much heat was directed around the top portion of the nose gear oleo strut resulting in the "o" ring seals and plastic stop being overheated and melted.
Caution should be exercised to ensure that heat sensitive components are protected when using a hot air blower to preheat engines.
NOTE: This article was previously published in the 1977 General Aviation Inspection Aids.

### WHEEL FAIRINGS COLLECT DIRT

The wheel fairings were removed from a Piper Model PA-28-151 aircraft. Each fairing contained approximately 23 pounds of dirt. This aircraft had been operating from an unpaved airport.
NOTE: This article was previously published in the 1977 General Aviation Inspection Aids.

# MAINTENANCE NOTES

## ELEVATOR TRIM TAB FREEZING - EXPOSURE OF AIRCRAFT TO HIGH PRESSURE SOAP-AND-WATER WASHING AND INTENSE RAIN

The following Beechcraft Safety Communique, issued May 8, 1981, is reprinted in its entirety to advise all personnel involved with maintenance/operation of Beechcraft airplanes of a potential safety hazard.

The engineering investigation described in this communique was undertaken following reports of elevator trim tab freezing. In none of these instances was there any injury to persons or damage to the aircraft; and in every case, although the trim tab became inoperable, the elevator remained free at all times and responsive to pilots' manual input to the control wheel. The airplane always remained controllable although higher than normal pilot input forces were required.

Beech assigned an engineer, reporting directly to the Manager of Technical Engineering, with instructions to conduct an investigation which systematicallyeliminated various components in the trim tab system until the point or points of freezing interference with the free movement of the trim tab was located. That investigation established that the piano hinge by which the tab is connected to the elevator and the tab push rod end fittings were the only points involved.

Interviews with pilots who reported incidents of trim tab freezing provided Beech with the following profile for the occurrences:

1. In each reported incident, the aircraft had been washed with a soap-and-water solution and high-pressure washing equipment within a few days or weeks preceding the incident.

2. In every reported case, the aircraft had been exposed to prolonged or intense rain while parked on a ramp shortly before the flight.

3. The trim tab became inoperative (frozen) during flight in clear air or in IFR conditions which usually did not involve airframe icing sufficient to require the use of deicing boots. Trim tab freezing was not related to flight in airframe icing conditions. Most often it occurred in clea air.

4. The trim tab became inoperative after the aircraft climbed through the freezing level, during climb-out or cruise in a sustained low temperature environment.

5. All reported incidents occurred in an environment of subfreezing temperatures, usually at medium to high altitude.

6. Upon descent to an altitude where the temperature was above freezing the trim tab immediately became operative without any residual effects.

7. Although the trim tab became frozen, the elevator (which is not connected to the stabilizer by a piano hinge) remained entirely free. The aircraft is controllable with the elevator and can be adjusted to straight and level flight or descent by retarding power until the desired altitude and flight profile is obtained.

Piano hinges are utilized at various points in Beech airplanes including the elevator, rudder and aileron trim tabs on most models. It is the opinion of Beech engineers that high-pressure washing with soap-and-water solution removes the lubrication from these hinge-lines with the result that when exposed to heavy or prolonged rain, the water is free to invade the hinge-line. It then freezes along the entire hinge-line when the aircraft is operated in temperatures below freezing.

This analysis was confirmed by a series of ground and flight tests during which, without lubrication and after exposure on the ground to free water, freezing was encountered. After being dried and lubricated (LPS-1 applied by aerosol spray can), the exposure to free water and low temperature conditions was duplicated with the same airplane, but the trim tab remained entirely free.

Actual incidents of trim tab freezing have been reported and confirmed for Baron and King Air Models. Although trim tab freezing could occur on any of the models listed above, experience t date indicates that it occurs with multi-engine models which customarily fly at higher altitude and lower temperature environments.

To avoid trim tab freezing, Beech instructs the following procedure:
1. Do not expose aileron, rudder and elevator trim tab hinge-lines or their push rod systems to the direct stream or spray of high-pressure soap-and-water washing equipment.

2. After high-pressure or hand washing, and at each periodic inspection, lubricate the hinge-lines and push rod end fittings with a water displacement lubricant (either CRC 3-36, LPS-1 or WD-40).

NOTE: Maintenance Manuals will be revised accordingly.
Please make a note in your manual until revised.

If trim tab freezing is encountered during flight, Beech recommends the following procedure:
1. Do not attempt to free a frozen trim tab by activating either the electric trim or manual trim controls. The force required to break the ice will probably exceed the force that can be delivered to the hinge-line by either electric or manual controls. Overstressing the trim tab cable circuit or the electric drive unit could damage either or both.

2. Alter power settings until the aircraft is reasonably well in trim and can be manually flown in the desired flight path without uncomfortable stick pressures. Keep in mind that the control surfaces (elevators, ailerons and rudders) are not attached by piano hinges and will remain free and responsive to the normal commands of the pilot.

3. Trim tab freezing should not be an occasion for an emergency descent and landing.

4. Please report any incident of trim tab freezing to Commercial Service, Beech Aircraft Corporation, Wichita, Kansas 67201, so that we may investigate the background and particulars of the flight in order to confirm that the analysis of these occurrences and methods for avoidance presented in this communique are correct in every respect.

Finally, it is appropriate to comment upon some of the other possible effects of washing your airplane with soap-and-water solutions dispensed at high pressure; high-pressure washing can carry the required lubrication away from wheel bearings, uplock rollers and propeller hub bearings if directed on or into these components. It can also damage avionics equipment if the stream is directed into overboard cooling ducts. In power plant areas there are garlock type seals which could be unseated by a high-pressure stream which, in turn, will allow contaminants to enter the sealed system. High-pressure sprays should not be directed upon the wings, fuselage or tail assembly from the rear where the structure is exposed to invasion by moisture and chemicals which can result in corrosion damage to structural members as well as moving parts.

Make certain that those responsible for servicing of your airplane are advised of these conditions and use proper caution when washing the airplane so as not to direct the high-pressure stream or spray into areas that might be damaged or adversly affected. Be certain that they are also instructed to lubricate the appropriate places after washing.

## PRATT & WHITNEY AIRCRAFT OF CANADA PT6 FUEL PUMP

There have been several incidents of fuel pump and FCU removals due to the grease being washed from the drive bearings of the FCU. In some of these removals, the expected fuel leak at the fuel pump drive seals has not been confirmed by bench testing the unit prior to its disassembly.

A probable cause for the washing of grease from the FCU drive bearings is the washing of the external surface of the engine. In spray washing around the starter/generator and fuel pump/FCU areas, it is possible to force the petroleum solvent into the FCU governor vent holes, causing the washing of the drive bearings. These vents are located on the left side of the governor portion of the FCU.

This position of the vent holes exposes them to the easy introduction of a spray wash due to the starter/generator discharge air being in the vicinity. This discharge air can carry with it carbon worn from the brushes and possibly oil from a starter/generator drive seal leak. Also, when servicing the oil system, any spillage of oil seems to find its way to this area, contributing to the dirty condition that requires cleaning it up.

To sum it up, be careful when washing the exterior of the FCU. DO NOT allow any wash solution to enter the vent holes of the FCU. It can give you a false indication of a fuel pump leak, causing unnecessary expenditures. Maintenance Advisor - Airwork Corporation.

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## ALERT NO. 44

MARCH 1982

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Flight Standards National Field Office

TD 4. 414:

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AC 43-16

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

# GENERAL AVIATION AIRWORTHINESS ALERTS

MARCH 1982

FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

### AEROSPATIALE

| | | |
|---|---|---|
| Aerospatiale<br>Model AS-350D | Loose Tape | During maintenance, it was observed that the adhesive tape was coming loose from the swashplate guide. The loose tape could jam between the guide and ball ring. |

### BALLOON WORKS

| | | |
|---|---|---|
| Balloon Works<br>Model Firefly 6B | Cracked Nuts | A repair station reported finding the compression nuts at the burner manifold cracked. Some of the fittings had evidence of corrosion which may be contributing to the problem. Several cracked nuts have been found. |

IN ORDER TO ENSURE CONTINUED RECEIPT OF THE "ALERTS," AN ADDRESS CHANGE MUST BE REPORTED TO THE FAA DISTRICT OFFICE UNDER WHICH YOU EXERCISE YOUR CERTIFICATE.

## BEECH

Beech
Model C23

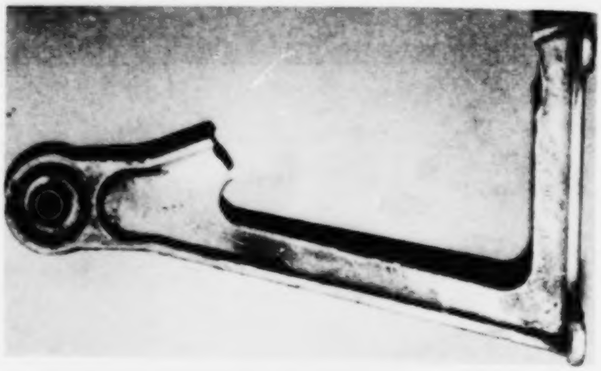
Loose Microswitch

The flap microswitch was loose which caused the flap motor to burn. Submitter advises that frequent checks of the microswitch for condition may prevent flap motor problems.

---

Beech
Model C-45H

Elevator Hinge Bracket



During a 100 hour inspection an unusual amount of movement was detected in the left elevator outboard hinge. An investigation revealed the hinge bracket upper strut had separated from the base of the bracket. The surface of the separation was hammered to a smooth surface, indicating the condition had existed for some time. Time on the pictured bracket - 3,335 hours. Inspection of another C-45H, with 6,507 hours time in service, disclosed the same condition. Both aircraft had gap strips installed between the elevator and the stabilizer which covered the brackets, making it difficult to inspect the area.

---

Beech
Model 76
(Australian Registry)

Main Landing Gear
Shock Absorber Connector
P/N 105-810020-7

Routine inspection revealed cracking of one lug of the connector. Destructive examination showed that the stress corrosion cracking extended right across one side and half way across the other side of one lug and similar cracking had started on the other lug of the connector. Aircraft time since new - 981 hours.

---

Beech
Model C90

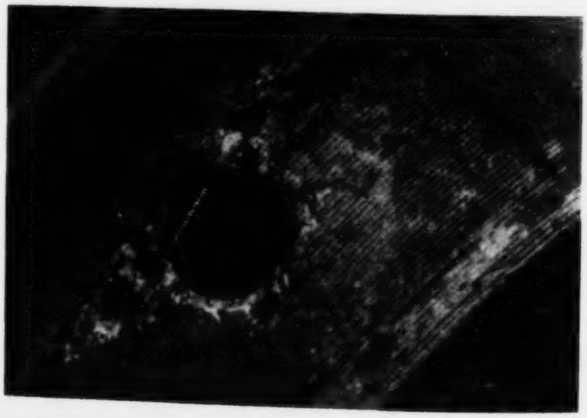
Inverter

Both inverters were intermittently inoperative. An investigation revealed that moisture was present inside of each inverter shorting out the unit. Total time on the inverters - 21 hours.

---

Beech
Model 200

Corroded Nose Wheel



Upon disassembly of the nose wheel‸corrosion was found around 6 of the 8 bolt holes. Wheel total time was 1,475 hours and records indicated there had been three tire changes within that time.

## B E L L

| | | |
|---|---|---|
| Bell<br>Model 206B<br>(Australian Registry) | Fuel Filter Drain Left Open | When draining the air frame fuel filter, the drain button, if fully pressed home, will be held open by the two legged spring clip. If care is not taken to close this valve (whose open condition may not be obvious if the boost pump is not switched ON) the engine can be started with the pilot unaware of the fuel pouring from the drain cock in the engine bay. Fuel filter drain valve BHC P/N 222-366-621-1 Purolator P/N 7582300. |
| Bell<br>Model 206B | Rough Bearings | There was a high frequency vibration in the tail rotor system. An investigation revealed the number 3 and 4 tail rotor drive hanger bearings were rough. The bearings were replaced which eleminated the vibration. Total time - 249 hours. |

## B O E I N G

| | | |
|---|---|---|
| Boeing<br>Model A75N1<br>and B75N1<br>(Stearman) | Arm Assembly<br>P/N 75-3417 | The right rudder bellcrank idler arm assembly was found cracked on a A75N1 aircraft. The crack was located at the center base where the spring clevis is attached. Identical cracks were found in both rudder bellcrank idler arm assemblies on a B75N1. The spring clevis must be removed to inspect the area for cracks. |

## C E S S N A

| | | |
|---|---|---|
| Cessna<br>Model 172 | Broken Main Gear | The right main landing gear leg broke while the aircraft was being pushed to a parking area. The leg broke off where a step had been arc welded to the leg approximately one week prior to failure. |
| Cessna<br>Models 172<br>and 182 | Cable Tension | There have been recent reports of finding the aileron, elevator and flap cables slack - very little tension. This condition was found on low time aircraft. |

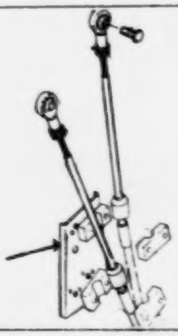
AN OUNCE OF PREVENTION IS WORTH TONS OF FIRE EQUIPMENT

| | | |
|---|---|---|
| Cessna<br>Model 182 | Fuel Cap | Reports of problems with the replacement red plastic fuel caps continue. A recent report advised that if the cap is slightly tilted when installed the fuel tank will siphon dry. Also, as the fuel is siphoned out, the bladder cell is pulled to the top of the tank, lifting the fuel float and the fuel gauge registers full even though the tank is empty. Submitter advised of this condition on three separate Cessna 182 aircraft. |

Cessna
Model U206G

Bracket
P/N 1250401-2

The mixture/throttle control bracket broke on one aircraft resulting in a power loss and a forced landing. Cracked brackets were found during a special inspection of other 206 series aircraft. The bracket is in a difficult area to inspect and is easy to overlook during routine inspections.



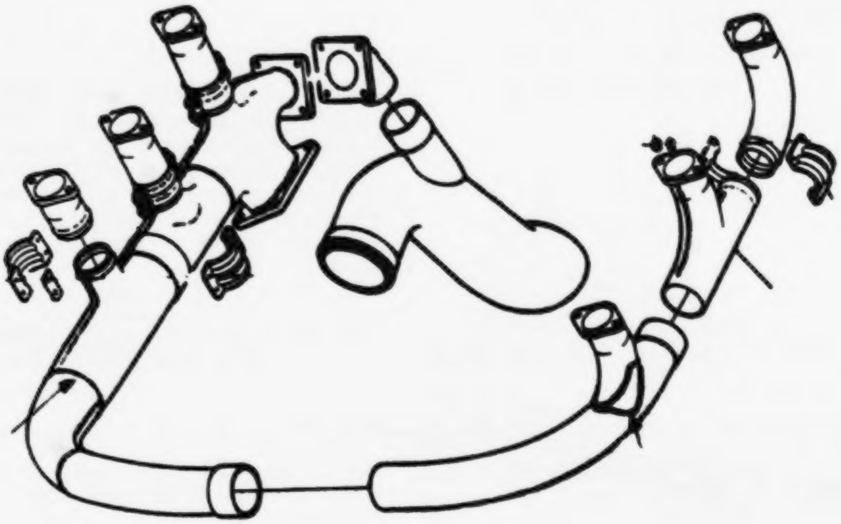
| | | |
|---|---|---|
| Cessna<br>Model T210M | Brake Line | The left and right brake lines were found chafed approximately 75 percent through the lines by the wheel half bolt heads. Aircraft time - 531 hours. |
| Cessna<br>Model 210M | Nose Gear<br>Strut Collar | The aircraft landed with the nose gear retracted. Both normal and emergency methods had failed to extend the gear. The gear was found cocked and hanging up in the gear well. After the gear was extended the lower strut collar and the turning stop pin were found broken. Improper use of powered towing equipment was suspected to have contributed to the problem. |
| Cessna<br>Model 310 | Nose Gear Collapsed | The nose gear collapsed during landing. An investigation revealed the nose wheel mud guard and straps had caught on the gear drive tube to torque tube attach bolt and bent the intermediate drive tube which prevented the nose gear from locking in the down position. Further investigation revealed the gear drive tube to torque tube attach bolt was 1/8 inch too long and was installed opposite as shown in the service manual illustration. Another aircraft was reported to have had the mud guard torn loose before the nose gear failed. |

A MINUTE FOR SAFETY IS BETTER THAN A MONTH FOR REPAIRS

Cessna
Model P337H

Exhaust Collector
P/N 1555010-21

The pilot noticed a loss of forward engine manifold pressure and shut down the engine. An inspection of the exhaust system disclosed the stack at No. 5 cylinder was cracked 360 degrees and had separated from the flange going to the cylinder. A crack was also found in the left crossover which could have been caused by the load imposed after the No. 5 cylinder crossover and riser assembly had broken. Total aircraft time - 372 hours. The operator had experienced an indentical failure on another low time P337H aircraft. Another report advised of the crossover pipe breaking at the weld for the riser on No. 6 cylinder. The crossover pipe came out of the slip joint and exhaust gasses damaged the front engine mount aluminum structure.

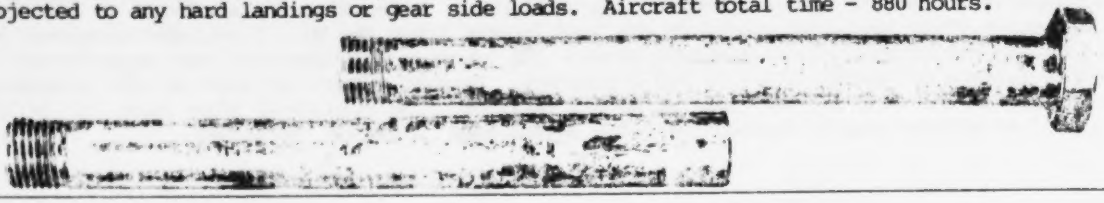


| | | |
|---|---|---|
| Cessna<br>Model 421C | Exhaust Riser<br>P/N 5155166-8 | Flames were observed under the right engine during landing. The pilot secured the engine boost pumps and fuel valve on landing roll. No flames were evident after the engine was secured. An inspection revealed the exhaust riser at No. 5 cylinder was leaking and there was evidence of excessive heat in the accessory section and flame damage to the exhaust pipe shroud. Part total time - 4 hours. |
| Cessna<br>Model 425 | Seat Track Stop | The right forward rear facing seat would not move a sufficient distance forward to allow the emergency exit door to be opened. The same condition was found on three additional C-425 aircraft and on two C-421C aircraft. |
| Cessna<br>Model 500 | Rudder Servo Cables | The right autopilot servo cable was replaced because of broken strands in the cable where it passes through the fairlead in the tail cone area. The left cable was removed from the inaccessible area and it was found to have 30 broken strands. Total time on the cables - 1,454 hours. |

Cessna
Model 550

Sheared Bolt
P/N NAS 464P8A-72

The bolt head was found sheared during a preflight inspection. This was the forward bolt that attaches the barrel to the landing gear trunnion. It was reported that the aircraft had not been subjected to any hard landings or gear side loads. Aircraft total time - 880 hours.



## CONSTRUCCIONES AERONAUTICAS

CASA
Model C-212-CC

Torque Arm Bolts

During landing, the upper and lower nose gear torque link bolts sheared in two places on both bolts. This allowed the torque link to separate from the strut. A C-212-CB aircraft developed nose gear shimmy during landing. The nose gear upper and lower torque link bolts were removed and were found cracked at the grease release holes.

## DEHAVILLAND

deHavilland
Model DHC-6-200

Cracked Rudder
Pedals

The captains left and right rudder pedals were found cracked at the pivot boss.

## GULFSTREAM AMERICAN

Gulfstream American
Model GA-7

Pressure Regulator

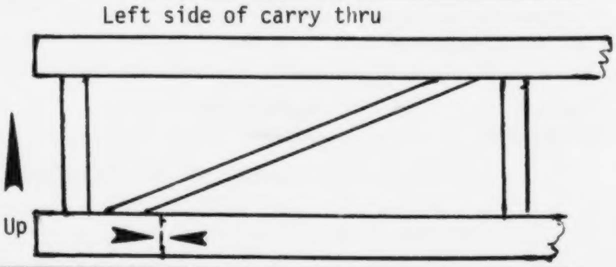
It was reported that the design of the system allows carbon particles from the vacuum pump to enter the vacuum system. Carbon build-up on the relief valve causes the valve to fail in the open position. This causes a malfunction of the vacuum system.

## HELIO

Helio
Model H-250

Carry Thru Assembly
P/N 295-030-401

A circumferential crack was found on the left side of the lower horizontal carry-thru tube. The crack was detected by use of dye penetrant inspection. Location of the crack is depicted in the sketch. Aircraft time - 3,936 hours. Airworthiness Directive 81-26-07 applies to certain aircraft.



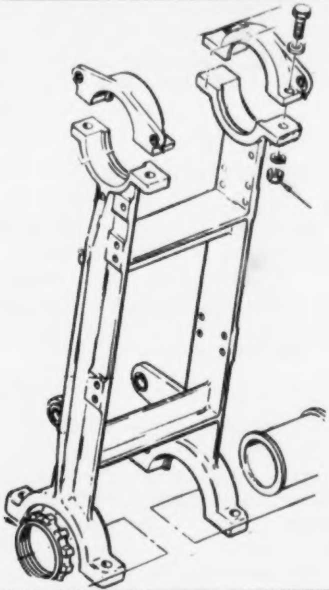
## HUGHES

| | | |
|---|---|---|
| Hughes<br>Model 269C | Broken Bracket | The fire extinguisher bracket broke during flight. The extinguisher fell hitting the pilots leg. Part total time - 441 hours. |

Hughes
Model 269C

Bearing Cap Nuts
P/N MS21042-4

The "H" frame upper and lower pulley bearing cap nuts were found cracked on four low time aircraft.



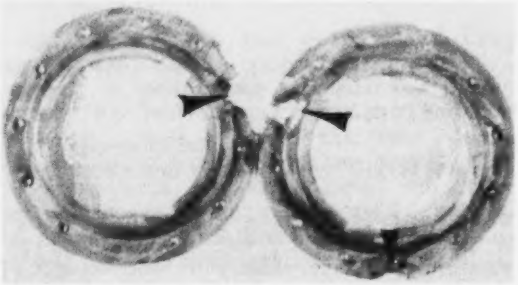
| | | |
|---|---|---|
| Hughes<br>Model 369D | Structure Corrosion | During an inspection, light to heavy corrosion was found under the cabin flooring. The aft section main cabin bulkhead attach brackets were nearly corroded through. The aircraft is used for aerial applications and the tank located in the main cabin had leaked. |

## MOONEY

Mooney
Model M20C

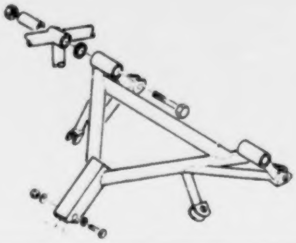
Rusted Filler Neck

Continual water in the fuel problems was traced to the fuel filler ring rusted through above the cap o-ring seat. Submitter advised that this was the third aircraft found in this condition.



Mooney
Model M20E

Landing Gear
Truss Assembly
P/N 540001-503



The truss assembly was found broken just below the left mounting bracket. Probable cause was exceeding the turning limits during towing operations as there were other indications of the towing limits being exceeded.

---

P I P E R

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Piper
Model PA-31T

Aileron Bellcrank

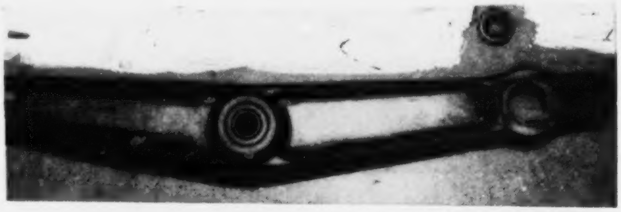
During a 100 hour inspection, the travel limit bolt jam nuts were found loose on the aileron bellcranks. The travel limits were reset, jam nuts tightened and torque seal applied. Aircraft total time - 210 hours.

---

Piper
Model PA-31T

Bellcrank Bearing

During a 100 hour inspection the spherical bearing in the lower end of the elevator bellcrank was found loose and worn. The bearing fell out of the bellcrank when the assembly was removed. The center bearing in the bellcrank has some rough spots when the bearing was rotated. This was the second loose elevator bellcrank bearing found recently by one repair station. Aircraft time on bellcrank pictured - 1,528 hours.



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Piper
Model PA-31T

Elevator Trim Tabs

During a 100 hour inspection, the left and right elevator trim tabs were found excessively loose. The attach bolts were approximately three turns loose and the holes in the attach brackets had elongated. There had been no reports of operation problems relating to the loose tabs. Aircraft time - 210 hours.

---

Piper
Model PA-31T

Ignitor Box
Bracket

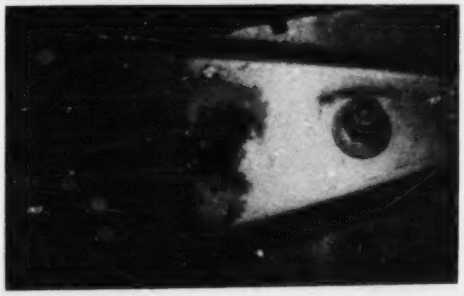
A repair station reported the left engine ignitor box bracket had been found cracked on every PA-31T that had been in for a 100 hour inspection. The bracket cracks out at the two attach holes. The cracks are repaired by welding as the bracket is made of steel.

---

Piper
Model PA-38-112

Aileron Balance
Weight Brackets

There have been reports of corrosion found on the aileron balance weight brackets. The corrosion was found when the lead weights were removed from the aluminum ribs during compliance with Piper Service Bulletin No. 723. The area was cleaned and primed prior to reinstalling the weights.



| | | |
|---|---|---|
| Piper<br>Model PA-38-112 | Jammed Elevator | During taxi the elevators became jammed in the down position. An investigation revealed the right vertical support brace for the VHF radio came loose at the top end and dropped down on the control chain which jammed the elevators. The support brace attaches to the radio support channel, P/N 77817-02. The top side of the brace had a machine screw with a tinnerman nut and the screw had backed out. The lower side had a "PK" screw with a tinnerman nut and when the radio fell this screw backed out. The failed tinnerman nuts were spread. Aircraft time - 25 hours. |
| Piper<br>Model PA-44-180 | Carburetor Air Box, P/N 86245-21 | The carburetor air box was found cracked at all four mount bolt holes where the air box attaches to the carburetor. There have been several reports of mount bolt hole cracks in the improved design air box. Part times on four recent reports were from 152 to 307 hours. |
| Piper<br>Model 602P | Propeller Control Cable | The right engine propeller control was reported as stiff and hard to move. This was the second right engine propeller control cable replaced in 341 hours of operation. Cable routing and sharp bends contribute to the problem. |

## SIKORSKY

| | | |
|---|---|---|
| Sikorsky<br>Model S-76 | Cracked Bearing P/N SB 5208-102 | During compliance with Airworthiness Directive 81-21-04, the flange on the inner race was found cracked and two pie shaped pieces missing. No adverse flight conditions had been reported. Total aircraft time - 162 hours. |

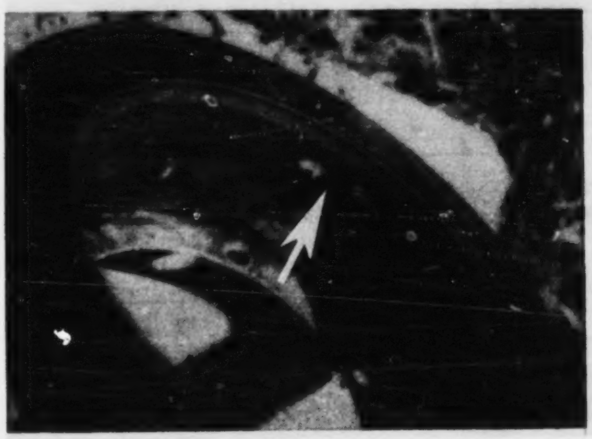
## SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA226-AT | Cable P/N 26-71022-025 | Soon after takeoff, the pilots and first officers control wheels operated independent of each other. A landing was accomplished without incident. An investigation disclosed the interconnect cable between the two control wheels had come off of the pulley at the lower end of the pilots control column. The cable tension was low and Swearingen Service Bulletin 27-022, which provides for cable guards to be installed, had not been accomplished. |

EACH AIRCRAFT SAFETY BELT MUST BE EQUIPPED WITH AN APPROVED METAL TO METAL LATCHING DEVICE PER F.A.R. 91.33 (b)(12).

## AIRFRAME COMPONENTS

### CLEVELAND



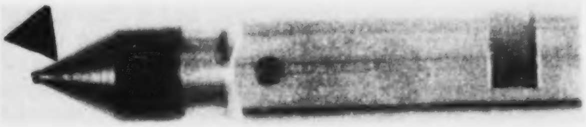
Cleveland Wheel Assembly — Brake Disc

There have been recent reports of finding the brake discs cracked around the inner sleeve. The cracked discs in two recent reports were found on Piper PA-34-200T aircraft. Total time on the pictured disc - 508 hours.

## ACCESSORIES

### BENDIX

Bendix Carburetor Model NA53 — Float Needle P/N 390077



The pilot had experienced engine problems thought to be associated with the carburetor. The carburetor float level was found low. Removal of the float needle disclosed the needle tip was swollen. The float needle had been installed approximately 3 months and the aircraft had flown 6 hours using 100LL fuel.

### BRACKETT

Brackett Air Filter Model BA-4106 — Air Flow Direction

The identification tag on the top of a new filter was found installed up side down. This showed the air flow arrows in the wrong direction.

EVERYTHING NEW IS NOT ALWAYS TRUE

## MARVEL-SCHEBLER

Marvel-Schebler
Carburetor
Model HA-6

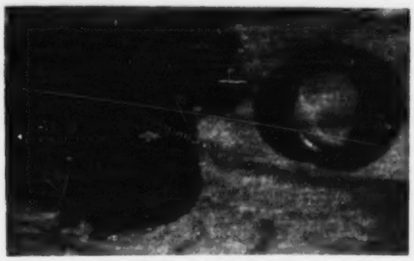
Float Shaft

The engine on a C-172RG developed a rich mixture at idle. Idle mixture adjustment had no effect on the problem. The carburetor was disassembled and the float shaft was found worn to the point that the float valve would not seat to stop the flow of fuel into the bowl. Carburetor total time -706 hours.

## SLICK

Slick
Magneto
Model 662

Broken Housing



At 993 hours an oil sample was taken during a progressive inspection. The filter contained minute aluminum particles but no visible iron. The cylinders were boroscoped and the rocker covers were pulled as a result of the oil sample analysis. No visual damage was found. Three hours after the oil sample alert, the right magneto housing was found broken. The snap ring had failed which allowed the plate to wipe the inside diameter of the housing causing the aluminum particles. The aluminum particles and the failed snap ring was flowing through the lubricating system. Part total time - 996 hours.

# ENGINES

## AIRESEARCH

Airesearch
Model TPE-331-10U

Oil Filter
P/N 76149

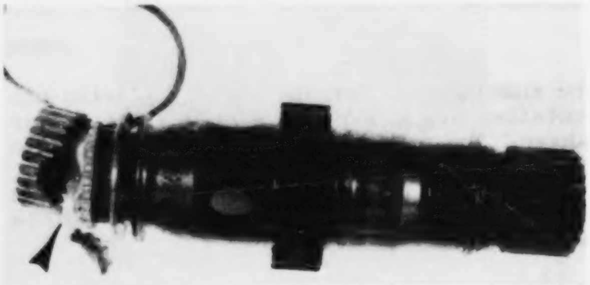
During removal of the oil filter, it was discovered the filter element had separated from the metal end. The adhesive appeared to have come loose or did not bond properly. Mobile Jet 11 oil is used in the engine. Filter total time - 114 hours.

## DETROIT DIESEL

Detroit Diesel
Allison
Model 250-B17B

Spur Adapter
Gear Shaft

The pilot stated he heard a "bang" noise during climb. The engine was shut down and the aircraft was returned and landed. An investigation revealed the shaft had sheared at the forward spline area. The operator advised of other failures of these shafts. Part total time - 165 hours.



## CONTINENTAL

| | | |
|---|---|---|
| Continental<br>Model TSIO-520-G | Engine Data Plate | It has been reported that some Continental TSIO-520-G engines have improper magneto timing stamped on the engine data plate. The data plate has 20 degrees stamped on the plate when it should be 22 degrees according to the Engine Type data sheet E8CE and Continental Aircraft Engine Service Bulletin M80-27. |
| Continental<br>Model TSIO-520-VB | Worn Exhaust Valve<br>P/N 637781 | A cylinder was removed at 883 hours since overhaul because of low compression and leaking at the exhaust valve. The valve had .050 wear starting 3/4 inch from the stem end and tapered down almost to the head. Nitralloy valve guides and the valves were installed in accordance with Continental Service Bulletin M81-14 at engine overhaul. A Teledyne Continental Motors customer service representative advised that full flow valve lifters, P/N 641709 should have been installed to provide better lubrication to the valve guides. Service Bulletin M81-14 does not include P/N 641709 valve lifter in the list of parts. A check with Teledyne Continental, reference the correct valve lifters to be used with Nitralloy valve guides, appears advisable. |

# PROPELLERS

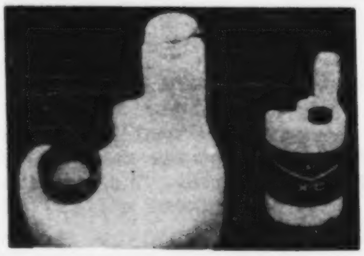
## HARTZELL

| | | |
|---|---|---|
| Hartzell<br>Model BHC-C2YF | Separated Decal | There was a report of the decal, installed on the inside wall area of the B-1592 spring retainer coming loose and causing the pitch locks to malfunction and the propeller to feather. The decal had been installed in accordance with Hartzell Propeller Instructions No. 102B. |

# CAUTION

### REMOVE SEAL

The aluminum seal from the top of a plastic oil container was found in the engine oil filter screen. The seal was probably pushed down into the container instead of being pulled completely off. The seal apparently came loose and entered the engine through the oil filler while servicing the engine.



## MAINTENANCE NOTES

### BRAKE BREAK-IN

Most pilots, and many mechanics, are entirely unaware of the fact that Cleveland brakes must be "broken in" each and every time the linings are replaced. (Unfortunately, the recommended break-in procedure is not given in any Pilot's Operating Handbooks, or even any shop manuals.) And yet, with organic linings that haven't been broken in properly, it's possible for a single hard brake application to carburize the pad material, preventing attainment of the design braking coefficient for the life of the linings-which won't be long, since carburized linings seldom live long.

To keep new linings from carburizing, proceed as follows: Call ground control and tell them you'll be making some extended taxi runs. Then, once you get the okay, start a 25 to 40-mph straight-line taxi...brake to a smooth stop using light pedal effort...and allow the brakes to cool for a moment. Begin another high-speed taxi, and-once more-brake to a stop using light pedal pressure. Allow the brakes to cool.

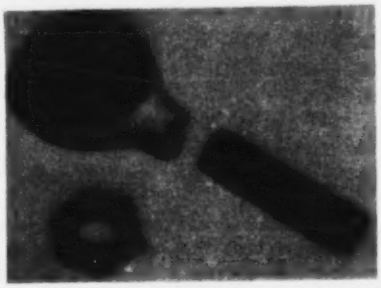
Go through the taxi, brake, cool cycle a minimum of six times (total). This procedure generates enough heat to cure the resins in the linings, but without bringing on enough Btu's to cause carburization. The end result: brake pads that work better, longer.

The above procedure is to be used only for organic-resin type Cleveland or McCauley linings-not metallic linings. If you own a plane with the metallic linings (an Aerostar, perhaps), you'll break in new linings by performing three consecutive hard brakings from a taxi speed of approximately 45 mph, allowing no cool-down period between stops. This procedure has the effect of glazing the surface of each lining, preventing uneven wear and just possibly, later brake-disc scoring.

If you're interested in longer brake life (and who isn't?), don't overlook these break-in procedures, regardless of whether you reline your own brakes or somebody else does. Your linings won't "go the distance" unless they get off to a good start. Light Plane Maintenance - December 1981.

## WOULD YOU BELIEVE IT

### POSSIBLE



The left aileron on a PA-24 was removed for balancing after re-painting. During removal of the aileron the control rod end was found broken. The broken area of the rod end was very rusty which indicated the rod end had been broken for some time. It is believed the aircraft had been flying with no left aileron control - so the report stated.

**WHEN EVEN THE SLIGHTEST DOUBT EXISTS - VERIFY!**

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APRIL 1982

U.S. DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Flight Standards National Field Office

TD 4.414:

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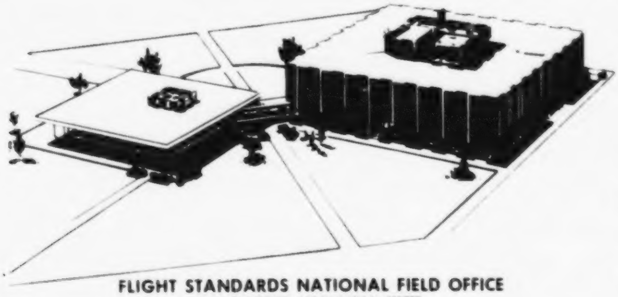
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

ADVISORY CIRCULAR
AC 43-16

# GENERAL AVIATION AIRWORTHINESS ALERTS

APRIL 1982



FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

### AEROSPATIALE

| | | |
|---|---|---|
| Aerospatiale | Tail Rotor Blade | During a daily inspection, the leading edge of one tail rotor blade was found separated just outboard of the abrasion strip. Total aircraft time - 47 hours. |

### BEECH

Beech Aircraft - American Safety Equipment Corporation Safety Belt and
Shoulder Harness Assemblies

There is a possibility of interference between the lap belt connector and buckle and also between the lap belt buckle cover and shoulder harness/crotch strap adapter on certain lap belt assemblies manufactured by the American Safety Equipment Corporation. Beech Class I Service Instruction No. 1158 identifies the suspect lap belt and shoulder harness assemblies and provides instructions for inspection and rework if required.

THERE WERE 170 GENERAL AVIATION AIRCRAFT ACCIDENTS IN 1980 RELATED TO POOR PREFLIGHT PLANNING - FUEL QUANTITY.

---

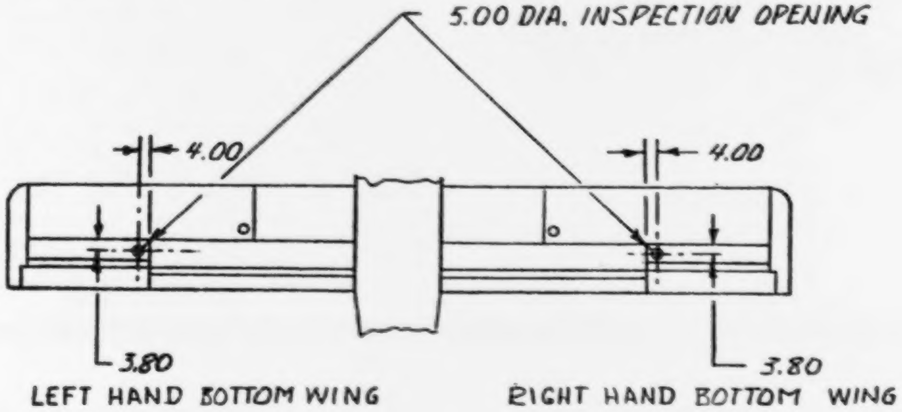
Beech
Models 19, 23
and 24 Series Aircraft

Aileron Push
Rod Ends

We continue to receive reports regarding lack of lubrication of the aileron forward rod end bearings. Lack of lubrication can result in seizure of the bearing which can then cause binding in the aileron control system. It is suggested that these areas be given special attention during the recommended 100 hour inspection/lubrication interval or whenever any stiffness or binding of aileron controls is noticed.

For ease of inspection, a five-inch round inspection opening may be cut in the lower outboard wing skin just aft of the wing spar at wing station 131.00 (see sketch below). Close the opening using Beech P/N 169-110000-197 doublers and P/N 169-110000-199 doors. Secure doors with AN525-832R6 screws and MS21047L08K nut plates. Use twelve (12) MS20470AD4-2 rivets, equally spaced, to attach the 169-110000-197 doubler to the skin.

If corroded rod ends are found during these inspections, submit a FAA Malfunction or Defect Report and replace the rod ends with new P/N 169-380082-3 rod ends per Beechcraft Class II Service Instructions No. 0858-151.



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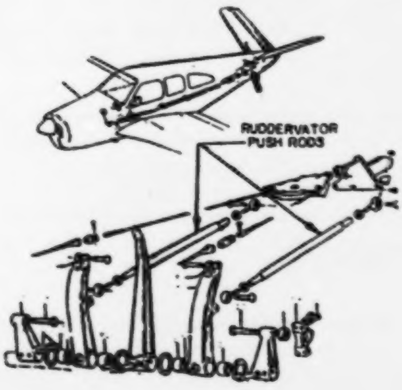
Beech
Model 35
Series

Ruddervator
Control Push
Rods, P/N 35-524106-6



Reports have been received of corrosion and trapped water found in ruddervator differential control push rods on Beech Bonanza (V-Tail) airplanes. Failure of these push rods can substantially alter the handling qualities of the elevator/rudder systems.

Beech Class I Service Instructions No. 0989 provides for inspection and anti-corrosion treatment of the Bonanza ruddervator push rods. Push rod assemblies that have been anti-corrosion treated by the manufacturer may be identified by the words "corrosion proofed" stamped in black ink near the center of the tube.

It is recommended that the ruddervator push rods be examined for corrosion and trapped water per Beech Service Instructions No. 0989 and that a report of any defective parts found be submitted via an FAA Malfunction or Defect Report.

---

INFORMED MECHANICS AND PILOTS CONTRIBUTE TO SAFE FLYING.

---

Beech Model 90 and 200 Series - Battery Installation

The following information is contained in both King Air 90 Communique No. 89 (September 1981) and Super King Air 200 Communique No. 33 (August 1981). It is the Beech reply to a FAA Maintenance Difficulty Report concerning battery corrosion attributed to rain/wash water collecting on top of the cells:

> "The 43BO30RB03 (Beech 101-381008-1) battery is a General Electric 24V, 34 AH, air-cooled battery. Cooling air enters the battery through several openings in the bottom of the battery case, flows through air passages between each cell and out a single opening in the lid. Water entering the battery was considered in the original design of the battery. Materials used in the battery do not corrode when exposed to water and air passages are free of barriers. Water should flow through the air passages and drain from the battery without accumulating in the battery.
>
> We have had occasional reports of "corrosion" and/or "shorts to case". It has been our experience that this has been caused by electrolyte spewage or leakage and not by water. In some cases, the electrolyte has formed a conductive path to the battery case and partially discharged the battery. Corrosion of the intercell links and hardware resulted because of galvanic action. The battery manufacturer is aware of this situation and is in the process of changing to a battery case with non-conductive coating to prevent discharge paths to the case. The non-conductive coating will be applied to G.E. batteries beginning with S/N 2674. This coating should preclude the possibility of electrolyte spewage forming a conductive path between the cells and the case.
>
> The 2.5 ma leakage current is well below the limit of 34 ma (1 ma/AH) established by the manufacturer. If the battery will not maintain a fully charged state, it is suggested that other causes be investigated. Perhaps that battery is being discharged through external loads or it has some internal cell damage.

The affected Maintenance Manuals will have a CAUTION added to Chapters 20 and 24 stating that the battery cooling air entrance (bottom of the wing) and exit (top of the wing) should be covered/blocked during washing operations. A modification to the battery-box access cover (which includes the cooling air exit hole) is being considered. One such proposal would add a drain or trough to the exit hole, allowing rain or washing water to bypass the battery interior.

| | | |
|---|---|---|
| Beech<br>Models A100/B100<br>with Sperry SPZ-200A<br>Autopilot Installed | Elevator Servo<br>Mounting Bracket | The support bracket for the Sperry SPZ-200A autopilot elevator servo has been found cracked on two Model B100 airplanes. The existence of similar cracks on Beech Models A100 and B100 aircraft with a Sperry SPZ-200A system installed is considered probable. Bracket failure could cause elevator and/or rudder control cable jamming.<br>Beech Class I Service Instructions No. 1197 provide for inspection and reinforcement of the Sperry SPZ-200A autopilot elevator support bracket on affected Beech Model A100 and B100 airplanes within the next 50 service hours. |

## BELL

| | | |
|---|---|---|
| Bell<br>Model 206A | Inner Ring<br>Assembly | A 1/8 inch wide by 3/64 inch deep groove was found in the swash plate inner ring assembly. The damage was caused by a monofilament line that had been attached to a kite and was picked up during flight. The helicopter was operated by a City Police Department. |

## BELLANCA

| | | |
|---|---|---|
| Bellanca<br>Model 8KCAB | Chafed Fuel Line | The fuel line from the left tank, which extends down between the windshield fairing strip and the instrument panel, had chafed against the fairing strip until a hole developed in the fuel line. Aircraft total time - 1600 hours. |

## CESSNA

Cessna Single-Engine Aircraft - 95 Amp Alternator Brush Holder

Cessna has issued Temporary Revision No. 1 (dated June 3, 1981) to the 95 amp Alternator Charging Systems Service Parts Manual No. D5016-3-13, dated September 1, 1980. This revision corrects the part number of the complete aircraft alternator brush holder assembly to Ford P/N D7FF-10320-AA.

The Service Parts Manual formerly identified the brush part number and referenced components as Ford P/N D20F-10320-AA, which is a copper filled automotive type brush assembly that has limited service life when operated in an aircraft alternator at altitude.

A copy of Temporary Revision No. 1 to the Service Parts Manual may be obtained from Cessna Aircraft Company, Marketing Division, Attention: Customer Service Department, Wichita, Kansas 67201, telephone (316) 685-9111.

| | | |
|---|---|---|
| Cessna<br>Model 152 | Horizontal Stabilizer | Water was found covering a 12 inch by 12 inch area of the horizontal stabilizer lower skin. This condition was found during a routine 100 hour inspection. The area was starting to show corrosion. Total aircraft time - 97 hours. |
| Cessna<br>Model 180 and 185 Series | Horizontal Stabilizer Jacksrew Access | A rectangular opening in the fuselage aft tailcone assembly is available for Model 180/185 aircraft to improve access to the horizontal stabilizer jackscrews for ease of lubrication and maintenance. This improvement is effective on production airplanes beginning with S/N 18504329. Service Kit No. SK185-27 has been developed to make this improvement availabel for installation on all earlier Model 180/185 airplanes. Cessna Service Information Letter No. SE81-41 provides more detailed information regarding this subject. |
| Cessna<br>Model 182Q | Loose Bolts | A popping noise was heard in the left wing strut area while ground handling the aircraft. An investigation revealed the top and bottom strut bolt nuts were loose and the bolts could be easily rotated. Aircraft time - 617 hours. |

IN ORDER TO ENSURE CONTINUED RECEIPT OF THE "ALERTS," AN ADDRESS CHANGE MUST BE REPORTED TO THE FAA DISTRICT OFFICE UNDER WHICH YOU EXERCISE YOUR CERTIFICATE.

Cessna
Model A185F

Mixture Control

The pictured mixture control cable came apart while being carried to the aircraft for installation. The control cable was new. The sleeve at the end of the cable was not secure. There have been reports of problems with mixture, throttle and propeller controls installed on Cessna single engine aircraft.

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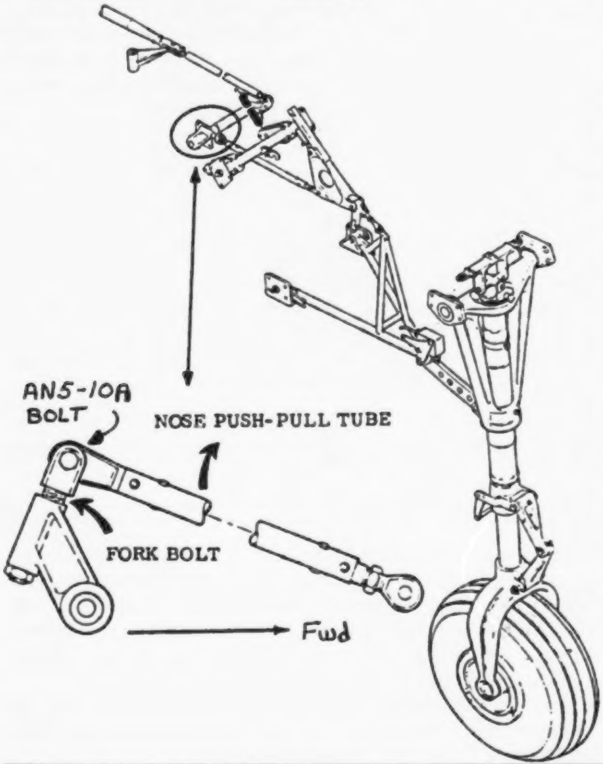
Cessna
Model 310
(1955 Model)

Nose Gear
Retraction
Linkage



An incident was recently reported wherein an emergency landing was made with the nose gear stuck in an intermediate position (approximately 40 degrees from fulldown).

Investigation disclosed that the bolt used to attach the forward push pull drive tube to the nose gear fork bolt was installed with the bolt head opposite to that shown in both the Service Manual and the Illustrated Parts Catalog. In addition, the installed bolt was 1/8-inch longer than the bolt specified in the parts catalog. In this instance, the end of the bolt became entangled in the nose gear mud guard and scrapper assembly and prevented any further movement of the nose gear. The nose gear intermediate drive tube assembly was also bent because of this interference.

It is recommended that the AN5-10A bolt used at this specific location always be installed as depicted in the Cessna 310 service publications. As clearances between moving components are usually minimal in this area, care should also be taken to assure that bolts used are the exact length specified for each application. In addition, periodically examine the nose gear mud guard and scrapper assembly for proper shape. Repair or replacement of components damaged or distorted will help maintain positive clearances.

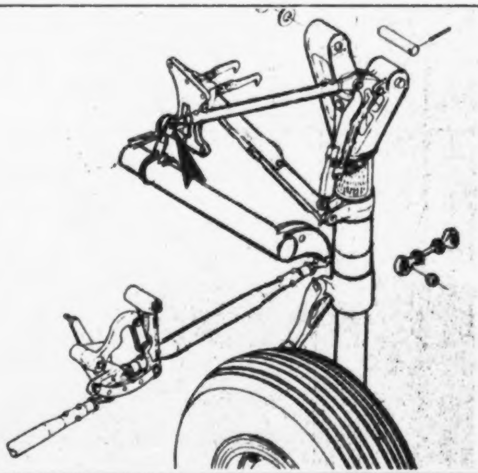
NOTE: Related article in Alert No. 44 March 1982.

---

Cessna
Model 340

Clevis Bolt
P/N AN25-16

During approach, as the pilot put the gear switch down, there was no indication that the gear left the up and locked position. All recommended emergency procedures were followed. The emergency hand crank was forced to the degree that the roll pin, P/N MS16562-130, sheared. The pilot made an emergency gear up landing. When the aircraft was put on jacks, the right main landing gear had to be forced out of the wheel well. An investigation revealed the clevis bolt that attaches the retract rod, P/N 0840125-15, to the torque tube had gouged into a wheel well bulkhead row of rivets and hung up. This bolt was installed with the head end aft. Left gear depicted.



| | | |
|---|---|---|
| Cessna<br>Model 340 | Rib Cracked<br>P/N 0831311-1 | During an inspection of the rudder, the rib that supports the rudder balance weight was found cracked. The crack extended from the lower lightening hole on the left side about 1 1/4 inches toward the upper lightening hole. One operator inspected eight aircraft for this condition and found four with the rib cracked. The tip fairing and lead weight must be removed to see the cracked area. |
| Cessna<br>Model 411 | Thrust Washer<br>P/N 630691 | When the alternator drive end nut loosens the thrust washer contacts the drive gear on the crankshaft and will eventually destroy the nut and washer. Steel from the assembly falls into the engine cavity around the alternator opening and into the engine lubricating system. One operator advised of several failures of the gear driven side mount alternators on Continental GTSIO-520 and TSIO-520 series engines. |

## CONSOLIDATED AERONAUTICS

| | | |
|---|---|---|
| Lake<br>Model LA-4-200 | Broken Casting | The left gear rocker casting broke during landing roll. The casting broke at the bolt hole where attached to the gear actuator. It appeared the bolt was seized with corrosion which contributed to the fracture. |

## DEHAVILLAND

| | | |
|---|---|---|
| deHavilland<br>Model DHC-6-200 | Cracked Rudder Pedals | During a detailed No 1 inspection, the co-pilot's left and right rudder pedals were found cracked at the pivot boss. On another aircraft, the Captain's left and right rudder pedals were found cracked at the pivot boss area. The third aircraft Captain's left and right rudder pedals were also found cracked at the pivot boss area. Times on aircraft were between 16,297 and 26,739 hours. |

## EMBRAER

| | | |
|---|---|---|
| Embraer<br>Model EMB-110P1 | Broken Seat Back | A passenger seat back tubing broke on both sides of the seat. The tubing broke through rivet holes in the tubing. The rivets are used to hold the aluminum seat bottom. Total time - 425 hours. |
| Embraer<br>Model EMB-110P1 | Frayed Cable | The right outboard aileron cable was found frayed and one strand broken during an inspection. The frayed cable was at the fairlead in the right wheel well where the cable is in a straight run. |

## GATES LEARJET

| | | |
|---|---|---|
| Gates Learjet Model All Aircraft | Pitch Servo Assembly Installation | The following information is contained in Gates Learjet Service News Letter No. 63 dated August 1981:<br>"When installing the Pitch Servo Assembly in the aircraft, special care should be taken to assure that all four washers are cemented to the Servo Assembly base at each mounting bolt hole. Installation of Servo Assembly with a washer missing will distort or break the casting when bolts are torqued." |
| Gates Learjet Model 20 and 30 Series | Door Latch Arm Pin Inspection | The cabin door latch arm pin eyes are to be dye-penetrant inspected every 1200 hours per applicable Service or Maintenance Manual procedures. A question has arisen as to why this type of inspection is used on a chrome-plated part.<br>Although the pins are chrome-plated, the surface to be inspected is the inner part of the eye hole. This surface has not been plated, thus allowing a dye-penetrant type inspection.<br>The above information was contained in Gates Learjet Service News Letter No. 65 dated October 1981. |

Gates Learjet Models 35, 35A, 36 and 36A Aircraft - Bleed Air Connectors

The following information is contained in Gates Learjet Service News Letter No. 64 dated September 1981:

> "Maintenance on aircraft that have experienced leakage around the Wiggins connectors in the Bleed Air System must include a visual inspection of the tubing bead areas for distortion, deformation, or cracks. If any of these discrepancies exist, the connectors may not properly tighten and allow the "O" ring to provide a uniform seal.
>
> When installing new "O" rings, the new RCF seals, now called out in the Illustrated Parts Catalog, should be used because of their higher temperature range. Apply a light coat of Dow Corning II compound to the seals as well as each mating surface.
>
> Tighten the connector only hand tight and then back-off 1/4 turn and safety. With the new RCF seals installed, there must be room left for thermal expansion."

## GRUMMAN

| | |
|---|---|
| Grumman Model G-111 | Elevator Trim Actuator P/N R-174-3A |

The elevator trim tab became inoperative. An investigation disclosed the lock pin, which held the castellated nut on the shaft, had fallen out. This permitted the nut to turn and tighten on the shaft, thereby jamming the motor assembly. The system tested satisfactorily after the lockpin was replaced and the unit reinstalled on the aircraft. Unit time since overhaul - 284 hours.

THERE WERE 18 GENERAL AVIATION AIRCRAFT ACCIDENT FATALITIES IN 1980 RELATED TO POOR PREFLIGHT PLANNING - FUEL QUANTITY.

## GULFSTREAM AMERICAN

Gulfstream American Gill Battery
Models AA-1 and AA-5

There are reports of finding the Gill battery, P/N PS6-9 installed in Gulfstream American AA-1 and AA-5 Aircraft. This battery is too tall and when the cover is installed the battery vents plugs are blocked. Gulfstream American Service Letter (Grumman) 75-2 states the Gill PS6-9 battery is not approved for the AA-1 and AA-5 Aircraft. It was reported that the Gill battery applicability chart lists the PS6-9 as a replacement battery for these aircraft - which could be contributing to the problem. Be aware!

## HAWKER SIDDELEY

Hawker Siddeley Wing Flap
Model HS.125-700A and Vane

During an after landing inspection, the pilot noticed the top skin on the left wing flap was cracked. The skin was cracked from the leading edge to the trailing edge. The crack was 37 inches from the inboard end of the flap and 12 inches outboard of the jackscrew. The wing flap main spar was found cracked through in the same area. There was also damage to the inboard side of the left aileron.

## HILLER

Hiller Tail Rotor Blade
Model UH-12 Non-Conformity

Investigation of a UH-12 accident revealed the tail rotor blade was not in conformity with the type design. The UH-12 had originally been a Hiller (Army) H-23D and it was determined that the altered blades were installed on the H-23 by the Army and not noticed by the FAA during its inspection prior to granting FAA airworthiness certificate. Owners/operators of any UH-12 (formerly operated by the Army as H-23D) procured from the Department of Defense should inspect the tail rotor P/N 55073 for conformity to type design. The proper blade material is 2024T3 Aluminum Alloy, 19 rivet spacing (21 rivets) in the trailing edge, a 45 degree chamfer at the trailing tip and drilled holes for balance screw safetying at the tips. The tail rotor blade that failed was made with 7075, had an excess of 21 rivets in the trailing edge and did not have safety holes drilled in the tips.

## HUGHES

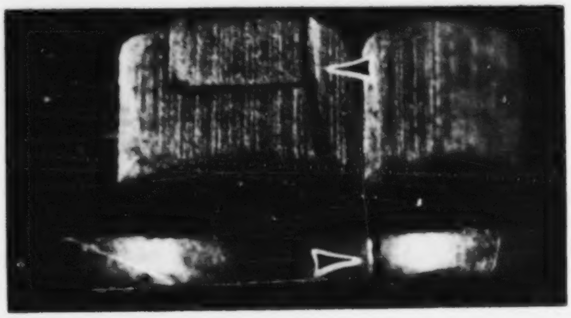
Hughes Belt Drive System
Model 269

The 269A5050-56 frame bearing should be inspected and relubricated each 300 hours for normal operation. The HMI states that more frequent inspections may be required when operating in adverse environments. Several Ag Spray Operators have found worn and disintegrated bearings at less than 300 hour inspection intervals. It is suggested that 100 or 200 hour inspection and repack intervals with more frequent bearing replacements be incorporated whenever severe corrosive or hot-dusty operating conditions exist. A new H frame assembly with higher capacity - 78 bearings is available. For further information see Hughes Service Information Notice N-175.

Hughes
Model 269

Drive System Nuts

The type data requires high strength bolts and nuts throughout the drive system. Several cracked nuts have recently been returned for analysis and found to contain hydrogen embrittlement. MS 21042-4 nuts require an embrittlement relief after cad plate. These bogus nuts must have been procured without an MS certification or from a source other than the manufacturer. Be sure that all drive system fasteners are certified and, if a bogus nut is found, replace or check all other nuts used in critical applications throughout the helicopter.



NOTE: Related article on page 7 of Alert No. 44 March 1982.

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Hughes
Model 369D

Upper Hinge
Pin Missing

The top of the pilots door blew open during flight. The increased pressure caused the pilots overhead window to disintegrate. An investigation revealed the door upper hinge pin had fallen behind the plastic shield around the door hinges. The locking ball was missing which allowed the hinge pin to fall out of the hinge.

## ISRAEL AIRCRAFT

Israel
Model 1124

Broken Brake Disc

While taxiing, the right brake stationary disc broke and caused the wheel to lock. An investigation revealed the disc had previously cracked at a stress relief point. Part total time - 300 hours.

## PIPER

Piper
Model PA-18

Wing Flap Assembly
P/N 12773-01

During the investigation of the appearance of an abnormal position of the right wing flap, it was discovered that 8 of the 10 rivets on the outboard hinge were sheared and the inboard hinge was cracked. A further check revealed that the rivets on all the surfaces were Type "A" (dead soft). Correction was made by replacing the rivets with "AD" rivets in the hinge brackets. Aircraft time 3,205 hours.

---

Piper
Model PA-18-150

Broken Rod End

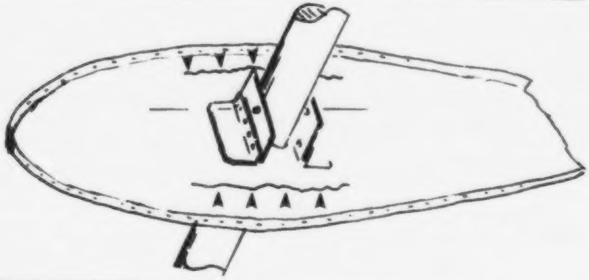
The right aileron push rod end was found broken during a preflight inspection. The rod end bearing at the aileron was seized which caused failure of the rod in the threaded area. The aircraft is based in a salt water area which probably contributed to the corroded and seized bearing.

| | | |
|---|---|---|
| Piper<br>Model PA-22 | Brake Pedal<br>P/N 750-999 | During an aborted takeoff the brakes failed, causing the aircraft to continue into the over-run area off the runway end. The pedal assembly had fractured at the brake cylinder attach fitting. Heavy braking had been applied during the aborted takeoff. Aircraft time - 1,836 hours. |
| Piper<br>Model PA-23-250 | Nose Gear Strut | Nose gear shimmy was experienced during taxi. Close inspection revealed a crack in the lower collar, and during repair a crack was found near the top of the strut. The cracks may have been caused by improper towing procedure. |
| Piper<br>Model PA-23 | Fuel Quantity Senders | During a routine 50 hour inspection, fuel fumes were detected in the cabin area. Further checking disclosed that all four fuel quantity senders were leaking at the terminals. Aircraft time - 411 hours. |

## ROCKWELL INTERNATIONAL

| | |
|---|---|
| Rockwell<br>Model NA-265-40 | Cracked Rib |

The rudder was observed to be 10 to 15 degrees off center with the controls neutral. An investigation revealed two longitudinal cracks in the bottom rib of the rudder. The cracks were adjacent to the bracket attachment to the torque tube. The damage was believed caused by jet blast some time previously.



## SCHWEIZER

| | | |
|---|---|---|
| Schweizer<br>Model SGS 2-33A | Fabric Covering<br>Stitching Thread | There have been three reports of deteriorated stitching in the fabric covering of the fuselage. The factory sewn seam on the Ceconite fabric at the bottom of the fuselage, from the tail wheel to the main landing gear area, had failed because the cotton thread used for the stitching had rotted. Also, the two inch cotton tape used over the stitch seam, had rotted over the same area. Times on aircraft were between 1,710 and 1,842 hours. |

## SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA226-TC | Torque Tube Binding | The nose landing gear would not release until the gear handle was recycled. An investigation revealed the uplock tube was stiff and binding. Gear retraction and extension was normal after cleaning and lubricating the landing gear assembly. |

# COMMUNICATION/NAVIGATION EQUIPMENT

## KING

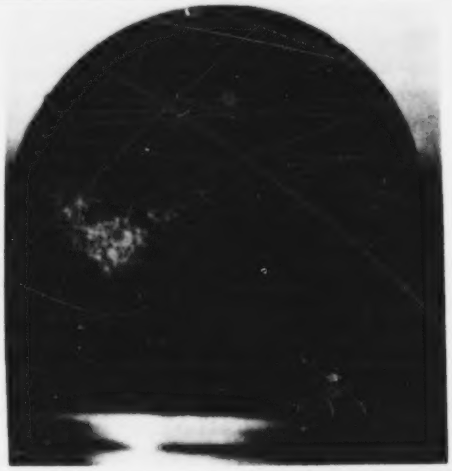
| | | |
|---|---|---|
| King<br>NAV/COMM<br>Models KX-155<br>and KX-165 | Channeling<br>Malfunctions | A channeling malfunction may occur in KX-155/KX-165 NAV/COM transceivers when an associated DME is not turned "on" or power is lost for any reason. The malfunction prevents changing the previously tuned frequency even though the new frequency is annunciated. COMM transmission will be 11.4MHZ greater than that of the last used receiver frequency prior to DME power loss. Incorporation of King Radio Corporation Alert Service Bulletins Nos. KX-155-6 and KX-165-6 will prevent the occurrence of this problem.<br>Affected Units:<br>KX-155 (14 volt) S/Ns 25932 and below<br>KX-155 (28 volt) S/Ns 35819 and below<br>KX-165 (14 volt) S/Ns 1766 and below<br>KX-165 (28 volt) S/Ns 10800 and below |

# ENGINES

## CONTINENTAL

| | |
|---|---|
| Continental<br>Model TSIO-520-BB | Valve Problems |

An operator advised of having considerable problems with Continental TSIO-520, O-470-R and IO-470-VO engines installed in Cessna 310 series aircraft. Low time engines - 200 to 250 hours since overhaul or top overhaul - develop a loss of compression. The compression is as low as 35 to 45 pounds per cylinder. Material build up on the valves flakes off and gets under the exhaust valve which causes loss of compression. The valves are not burned or pitted. Simple cleaning, buffing and touch up of the valves cures the problem. The valves and valve seats remain in good condition. Cause or contributing factors unknown.

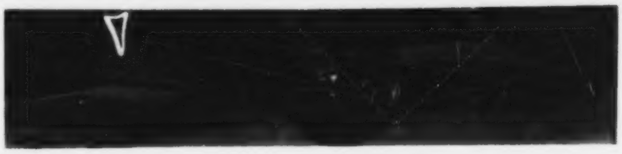


NOTICE TO READERS: THE GENERAL AVIATION AIRWORTHINESS ALERTS ARE, FOR THE MOST PART, PREPARED FROM INFORMATION SUPPLIED BY THOSE WHO OPERATE AND MAINTAIN AIRCRAFT. THE FAA ENCOURAGES THE REPORTING OF ALL MALFUNCTIONS OR DEFECTS THAT COME TO THE ATTENTION OF SERVICE OR OPERATING PERSONNEL, EVEN THOUGH THE PROBLEM HAS BEEN PREVIOUSLY REPORTED. THE MALFUNCTION OR DEFECT REPORT, FAA FORM 8010-4, WHICH SUPERSEDES FORM 8330-2, IS AVAILABLE FROM THE LOCAL GENERAL AVIATION DISTRICT OFFICE, AND MAY BE USED FOR REPORTING PURPOSES.

# PROPELLERS

## GREAT AMERICAN

Great American        Broken Blade



One propeller blade broke off which resulted in the total remaining propeller and mounting flange separating from the Quickie II Aircraft. There were no protective cap tips installed. The propeller manufacturer had advised not to fly the propeller more than one hour total operation without cap tips installed. The propeller had been operated approximately 11 hours prior to failure. Manufacturers recommendations should be observed regarding propeller operation.

## ULTRALIGHT PROPELLERS

Recently, a laminated propeller delaminated on an ultralight causing destruction of the craft. The prop manufacturer said that every circular, every sales slip that he sends out has on it that all propellers should be securely centered by a boss on the center of the shaft. However, he is aware that some manufacturers send out engine flanges with no center boss. All aircraft propellers should use a center boss to keep it centered. The bolts merely hold them on. The ultralight movement is probably unaware of this practice, but should be notified as soon as possible that this is an essential part of design and construction of an ultralight.

All ultralight and other propellers should be securely centered on a boss on the propeller shaft, not just bolted in place. With no centering boss, the bolts quickly elongate the bolt holes and cause the propeller to vibrate and eventually disintegrate.

Designee Newsletter December 1981.

# MAINTENANCE NOTES

## CORROSIVE ADHESIVE

Bell Helicopter Textron personnel advised us that the interior panels of a Bell Model 212 helicopter were changed by a modification center. Interior linings and sound suppression materials were applied to fuselage structural panels with an adhesive. The specific adhesive was not known. This interior change was approved on FAA Form 337. These linings were subsequently removed and excessive corrosion was allegedly found where the adhesive had been applied to the structural panels. Corrosive effects of adhesives are generally evaluated in type certification and supplemental type certification programs. However, FAA Form 337, "Field Approval," programs may not receive adequate scrutiny due to personnel inexperience and inadequate information about the adhesive and its use.

All maintenance and repair station personnel should be aware and obtain adequate information prior to using adhesives.

## GENERAL AVIATION WEATHER RELATED ACCIDENTS IN 1981- 186.

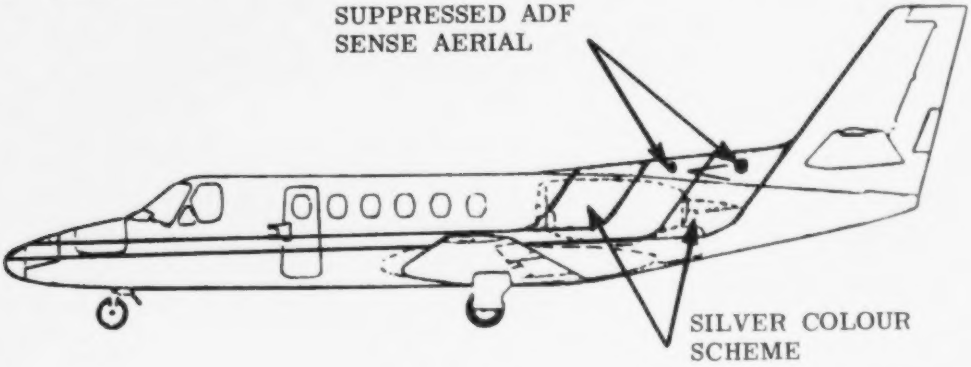
### ADF SYSTEM DEGRADED BY CUSTOMISED AIRCRAFT COLOUR SCHEME

The following article is a re-print from the Australian Department of Transport Major Defect Summary, December 1981, which had been extracted from the U.K. CAA General Aviation Safety Information Leaflet 4/81.

A licensed radio engineer in the UK was asked to investigate very weak signals in both ADF systems on a US registered Citation. The cause was found to be the use of metallic reflective tape on the aft fuselage and dorsal fin in the vicinity of the suppressed ADF sense aerials. The tape, similar to "Bacofoil", formed part of the operator's "customised" colour scheme.

The effect of the tape was to increase the capacitance of the dorsal fin mounted sense aerials from the required 150 pf nominal to 1600 pf on one and 2000 pf on the other. The capacitance was restored to the required figure by removal of the tape from the area of the aerials.

Further investigation found that there was no electrical bonding of the metallic tape to the aircraft, nor was there any primer on the aircraft surfaces beneath the tape, this having been left off to improve adhesion.



CAA Comment:
The reporter makes a number of comments which are entirely relevant and important:

(a) With the increased use of suppressed aerials any changes to aircraft configurations or paint schemes should be checked and certified by all the appropriate "trades" - particularly the radio/navigation specialists, to ensure that there is no adverse effect on aircraft systems and equipment.

(b) Aircraft bonding requirements must be met at all times. If significant quantities of metallic foil or tape are used on aircraft surfaces adequate bonding must be provided.

(c) When large areas of aircraft skin are covered by adhesive film, provision must be made for periodic sample checks for skin corrosion beneath the film. This is particularly important if there is no primer present, as in the above case.

## WOULD YOU BELIEVE IT

### STILL HAPPENING

The shipping plate, which holds the ARM switch in the OFF position, was found still in place during routine replacement of the Narco 10 ELT battery pack. In addition the external antenna had not been connected to the unit. Aircraft time - 422 hours.

TOTAL AIRCRAFT THEFTS IN 1981: 214, a 13% DECREASE FROM 1980.

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# General Aviation airworthiness ALERTS

## ALERT NO. 46

## MAY 1982

**U.S. DEPARTMENT OF TRANSPORTATION**
**Federal Aviation Administration**
**Flight Standards National Field Office**

TD 4.414:

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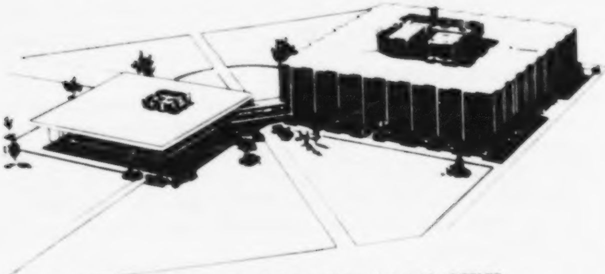
AC 43-16

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

# GENERAL AVIATION AIRWORTHINESS ALERTS

MAY 1982



FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

## BEECH

Beech Model 33, 35, and 36 Series Aircraft - 12 Volt Starter Relay

The following information is contained in Beechcraft Executive Airplane Service Communique No. 62 dated December 15, 1981:

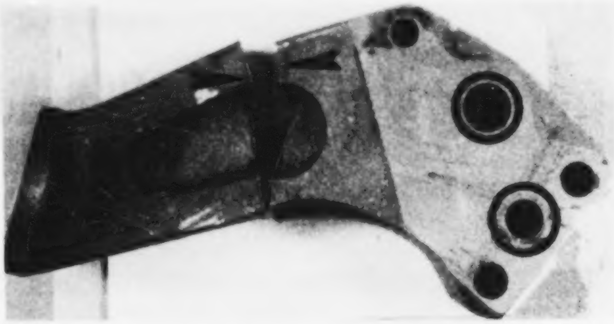
Beech Aircraft Corporation has available an improved starter relay for all Bonanzas with a 12 volt electrical system. This improved starter relay is manufactured by Prestolite under P/N SAW4204. The new relay offers an increased current rating and improved contacts which resist sticking. This relay is completely interchangeable and recommended as a replacement for the Delco-Remy P/N 1464 starter relay which was installed as standard equipment.

NOTICE TO READERS: The General Aviation Airworthiness Alerts are, for the most part, prepared from information supplied by those who operate and maintain aircraft. The FAA encourages the reporting of all malfunctions or defects that come to the attention of service or operating personnel, even though the problem has been previously reported. The Malfunction or Defect Report, FAA Form 8010-4, which supersedes Form 8330-2, is available from the local General Aviation District Office, and may be used for reporting purposes.

Beech
Model 58

Broken Mount

A lower left engine mount was found broken during a preflight inspection. Further investigation revealed the engine may have been misaligned which caused stress on the mount.



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Beech
Model 58

Worn Rod End

The pilot reported limited movement of the left engine propeller control. The investigation revealed an excessively worn propeller governor control rod end. This condition has been found on various models of Beech reciprocating engine aircraft. Submitter suggests special attention be given all engine control rod ends during inspections.

---

Beech
Model 76

Engine Mount Chafed

The lower left engine mount legs on both engines were found chafed approximately .025 deep by the induction air duct wires.

---

Beech
Models 95-B55,
E55, 58, 58TC
and 58P

Janitrol Heater
Drain Elbows

Recent reports from the field indicate some heater combustion chamber fuel drain elbows have been found cracked, corroded and even totally clogged.

Beech recommends the P/N MS20822-5D elbow (90 degrees) located at the lower aft side of the heater be replaced with a P/N MS20822-5J elbow, and the P/N MS20823-5D elbow (45 degrees) located at the lower forward side be replaced with a P/N MS20823-5J elbow. On the Model 58P only, replace the P/N AN816-4D nipple with a P/N AN816-5J nipple and the P/N 102-550048-3 tube assembly with a P/N 102-550048-39 assembly.

It is recommended these changes be made at the next scheduled heater inspection to reduce the possibility of the fuel drain elbows corroding closed. The corrosion resistant steel drain assemblies will be installed at the factory effective with the following airplane serial numbers: Model 95-B55, S/N TC-2394, Model E55, S/N TE-1191; Model 58, S/N TH-1260; Model 58TC, S/N TK-142; and Model 58P, S/N TJ-367.

NOTE: Related articles appeared in
Alert No. 38, September 1981, and
Alert No. 42, January 1982.

---

KNOWLEDGE IS ONE THING THAT DOESN'T BECOME SECOND HAND WHEN USED

Beech Model 200 Series - Air Conditioning System Condenser

There have been several incidents reported wherein the P/N 101-384003-1 air conditioning condenser has ruptured during operation on the ground.

Beech Aircraft issued King Air 200 Communique No. 33 in August 1981. This communique contains a recommendation that the safety clutch control circuit board, P/N 101-361015-1, be examined at the next scheduled maintenance cycle for evidence of resistor burns or opens and to replace any board as necessary. The communique also emphasizes the necessity for using only the standard 7 1/2 amp fuse on the P/N 101-361015-1 circuit board. The installation of an oversize or slowblow fuse will result in damage to the resistor. Beech has redesigned this circuit board using latching relays instead of replaceable fuses and will provide the board to the field for spares when a sufficient number are available.

Additional important information contained in the communique include a caution never to operate the air conditioning system with the P/N 50-410038-89 access door removed and a recommendation to check the high and low pressure safety switches for proper operating levels whenever system maintenance necessitates refrigerant removal.

NOTE: A related item to this subject was included on page 2 of Alert No. 17 dated December 1979.

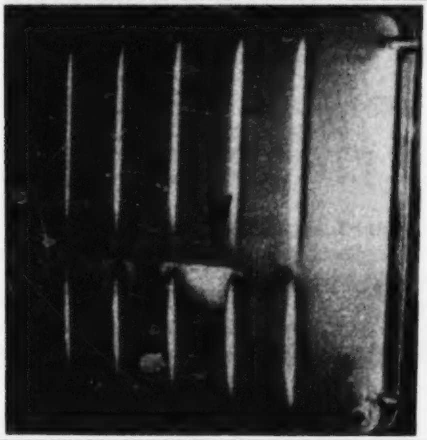
## BELL

| | | |
|---|---|---|
| Bell<br>Model 206L-1 | Fuel Cells | There were two reports of particles being found in the fuel filters. Investigations revealed the interior of the fuel cells were starting to deteriorate. Aircraft times were 1,147 and 1,383 hours. |
| Bell<br>Model 222 | Tee Fitting<br>P/N MS21909D4 | A leak in excess of 2000 feet per minute was experienced during a routine pitot/static system leak check. The Tee fitting at the landing gear warning air pressure differential switch was found cracked. Part total time - 387 hours. |

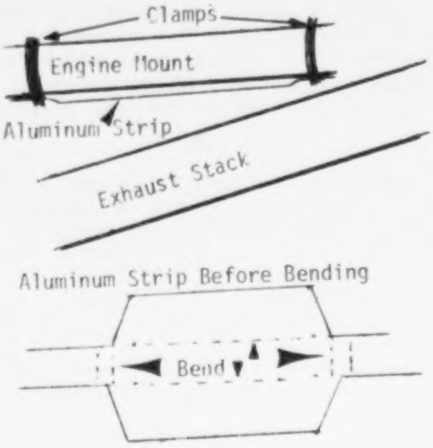
## CESSNA

| | |
|---|---|
| Cessna<br>Model 172 | Fuel Tank |

The right fuel tank was removed for inspection because of a small fuel leak. The tank had been chafing on the wing bottom, resulting in wear and corrosion on the tank surface. The protective rubber strips, between the wing skin and the tank were inaffective and possibly mislocated. Aircraft total time - 86 hours.



IN ORDER TO ENSURE CONTINUED RECEIPT OF THE "ALERTS," AN ADDRESS CHANGE MUST BE REPORTED TO THE FAA DISTRICT OFFICE UNDER WHICH YOU EXERCISE YOUR CERTIFICATE.

| | | |
|---|---|---|
| Cessna<br>Models R172K<br>(Hawk XP), 180, 182<br>185 and 188 Series<br><br> Clamps<br>Engine Mount<br>Aluminum Strip<br>Exhaust Stack<br>Aluminum Strip Before Bending<br>Bend | Engine Mount | There is a continuing problem with corrosion on those portions of the engine mounts which are exposed to heat from adjacent exhaust stacks. Cessna has issued Single-Engine Service Letter No. SE76-22, dated November 15, 1976, which suggests that a very high temperature enamel be applied to the areas of the engine mounts which are in close proximity to the exhaust stacks. This enamel is identified by Cessna P/N CES1054-812S.<br>Although the service letter specifically mentions the Model A185 and A188 series airplanes with the 300 hp engine, it is recommended the enamel be used on any airplane where corrosion of the engine mounts is accelerated by elevated temperatures. Cessna Single-Engine Service Letter SE78-27 was issued on April 24, 1978, to provide instructions for the use of the very high temperature enamel on the engine mounts of the Hawk XP series airplanes.<br>A Florida seaplane operator submitted this fix (sketch) which eleminated corrosion problem on his aircraft. Submitter advised use of a corrosion preventative compound under the stainless clamps. |
| Cessna<br>Model 177RG | Loose Boot<br>P/N S1938-3 | During cruise, there was vibration in the elevator control and a "banging noise" was heard in the tail section area. The aircraft was slowed to 110 mph and the vibration stopped. An investigation revealed the abrasion strip was loose from the left stabilator outboard end to approximately one foot from the fuselage. Submitter suggests the abrasion strip be repaired before flight if there are bubbles under the strip or if the strip is loose. |
| Cessna<br>Model 402A | Cabin Heat<br>Air Inlet | Five pilots, on three different air taxi flights involving three different Cessna 402A aircraft, reported loss of cabin heat and windshield defrost during critical portions of flight while in moderate to heavy icing conditions. After the windshield anti-icing alcohol supply was depleted, the pilot had to manually scrape the windshield inside and outside. An inspection after landing, in all three cases, disclosed a ball of ice had formed behind the heated portion of the pitot tube on the pitot mast. This ball of ice disrupted the airflow into the cabin heat air intake, which is directly behind the pitot mast. |
| Cessna<br>Model 402C | Sight Gauge Tube | The pilot noticed what he thought was smoke coming from behind the instrument panel. An after landing investigation revealed the hydraulic reservoir sight tube had melted. Further investigation disclosed a main gear uplock was out of adjustment which caused the hydraulic power pack to run continuously. |

| | | |
|---|---|---|
| Cessna<br>Model 404 | Brake Pedal Return<br>Spring P/N 0861711-3 | Several pilots reported the left brake was dragging. An investigation revealed the problem had been caused by a broken brake pedal return spring on the pilots left rudder pedal. A check of other Cessna 404's and 402's in the fleet revealed other broken brake pedal return springs.<br>NOTE: Similar article on Cessna 441 aircraft in Alert No. 35 June 1981. |

## EMBRAER

| | | |
|---|---|---|
| Embraer<br>Model EMB-110P1 | Gear Bolt Stripped<br>P/N 14456 | During taxi for takeoff, the crew felt a slight jerk. No problems were observed by a visual check. The in-transit light remained on after gear retraction. The gear was extended and a visual inspection revealed the right main gear was cocked 30 degrees inboard and the torque link had separated. An investigation disclosed the bolt, holding the ball joint assembly at the apex of the torque link, had stripped. Further investigation revealed the left gear was also stripped but the torque link assembly had not separated. |

## GATES LEARJET

Gates Learjet Aircraft - Collins ADF 60 NAV Receiver

The following information is contained in Gates Learjet Service News Letter No. 64, dated September 1981:

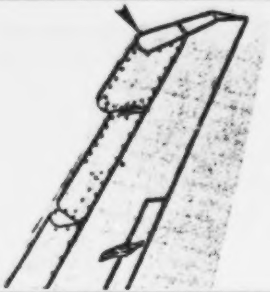
"If your aircraft utilizes a Collins Radio ADF 60 Naviation Receiver and the associated ADF AC Circuit Breaker has a history of inadvertent "openings"; the problem may be corrected by replacing the existing 3MCI-200-2 circuit breaker with a 3MCI-202-2 circuit breaker."

| | | |
|---|---|---|
| Gates Learjet<br>Models 35<br>and 36 | Bleed Air Shutoff<br>Valve, P/N 3213726-1-1 | Two of the most common causes for the malfunction of the bleed air shutoff valve are:<br>(a) Heat deterioration of the seals and "O" rings; and<br>(b) Filters and control orifices being restricted or blocked by atmospheric contamination ingested into the valve through the engine compressor section.<br>An in-field functional test has been added to the Model 35/36 Maintenance Manual which will allow operators to determine the operational status of their bleed air shutoff and regulator valves. This test procedure will be provided in a forthcoming revision to the Maintenance Manual.<br>Aircraft Affected:<br>Model 35, S/Ns 35-002 thru 35-063<br>Model 36, S/Ns 36-002 thru 36-017 |

Gates Learjet
Model 25D

Butt Plate Cracks

The top butt plate on top of the rudder was found cracked on two separate aircraft. The cracks were at the front of the plate in the bend area. Aircraft time on one report - 601 hours.



## H U G H E S

Hughes
Model 369

Fuel, Oil and
Instrument System
Plastic Hoses

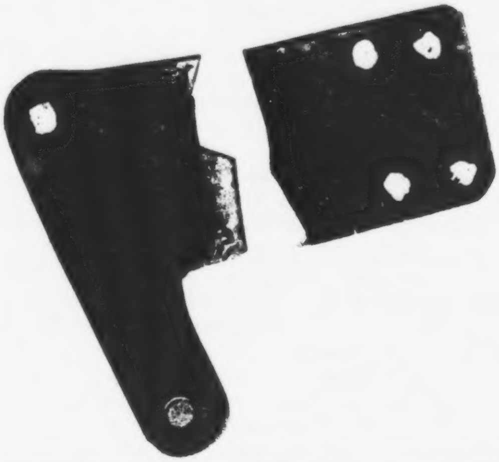
Non-metallic hoses and tubing, used in various locations, are susceptible to brittleness and subsequent cracking as a function of time, environment and sunlight. Several cracked hoses have been recently reported and a hazardous condition can exist when these hoses carry flammable fluids or vapors. During inspection, special consideration should be given to hoses carrying flammable fluids or vapors and brittle or cracked hoses should be replaced.

## G U L F S T R E A M   A M E R I C A N

Gulfstream American
Rockwell
Model 112A

Broken Bracket

Throttle movement had no effect during final approach for landing. An investigation revealed the throttle cable bracket in the engine compartment had broken. The failure appeared to originate at a notch in the bend area of the bracket.

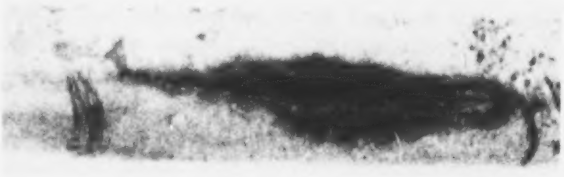


## M O O N E Y

Mooney
Model M20B

Split Tube

A two inch long split was found in a lower fuselage longeron tube. Apparently water had entered the tube and the water froze causing the tube to split.



## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-28-161 | Leaking Fuel Line | The pilot smelled fuel fumes in the cockpit during flight. An after landing investigation revealed the carpet was wet with fuel. Further investigation disclosed the fuel line from the right wing had numerous pin size holes through the line. Total aircraft time - 1,249 hours. |
| Piper<br>Model PA-28-180 | Gear Cylinder | The attachment lugs, for the gear torque links, broke on the right landing gear during a landing. There were indications of an existing crack prior to complete fracture. Aircraft time - 1,958 hours. |
| Piper<br>Model PA-28R | Loose ELT | The pilot noticed the elevator controls did not feel normal after encountering heavy turbulence. An investigation revealed the Rescu/88 ELT had fallen and was across the bottom elevator control cable. The mounting plate nylon latch had broken which allowed the ELT to fall onto the elevator cable. |
| Piper<br>Model PA-31-300 | Flap Drive Cable | A split flap condition was experienced during the landing phase. An investigation revealed sheared female drive splines on the left flap drive cable at the motor end. The flap drive motor may often be replaced for electrical reasons (brushes, burned armature, etc.) while the female spline in the drive cable continues in service. |
| Piper<br>Model PA-31-325 | Sheared Rivets | During compliance with Airworthiness Directive 81-15-04R1 the rivets in both outboard elevator hinge brackets to spar attachmnts were found sheared. The rivet heads were still in place but the brackets were loose. Aircraft time - 1,270 hours. |

## SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA226-TC | Spring Assembly<br>P/N 27-44045 | The flight crew advised of very light elevator controls during taxi. An inspection revealed the elevator spring had broken and separated at the center of the spring. Airworthiness Directive 81-22-04 had been accomplished 118 hours prior to failure. |

PATIENCE IS SOMETHING YOU ADMIRE IN THE AIRCRAFT PILOT TAXIING BEHIND YOU - BUT CAN'T TOLERATE IN THE AIRCRAFT PILOT IN FRONT OF YOU.

## ACCESSORIES

### CONTINENTAL

| | | |
|---|---|---|
| Continental | Oil Filter<br>P/N 643226 | A new filter was installed and torqued to specifications. Oil was lost during engine run. An investigation revealed the filter had been double threaded. The specified torque was reached before the filter sealed. Inspection of 12 new filters revealed the same condition-double threads. |

### SLICK

| | | |
|---|---|---|
| Slick<br>Magneto<br>Model 662 | Timing Decal<br>R<br>L | It was reported that the timing decals come off of the new distributor blocks during operation. This requires complete disassembly and remarking of the magneto. |

## INSTRUMENTS

### UNITED INSTRUMENTS

| | | |
|---|---|---|
| United Instruments<br>Altimeter<br>Models 5934P-1<br>and 5934PA-1 | Barometric Set<br>Knob | The article, on this subject which appeared on page 10 of Airworthiness Alerts No. 41, December 1981, contains an error. The middle sentence of the second paragraph should read: "Replace hard or otherwise deteriorated seals with a new seal from United Instruments." |

## ENGINES

### CONTINENTAL

| | | |
|---|---|---|
| Continental<br>Model TSIO-360 | Broken Adapter | There have been reports of the 90 degree tach drive adapter breaking on PA-28R and PA-34 aircraft utilizing the subject engine. The break occurs in the aluminum portion that attaches the tach drive to the engine. Weight of the tach generator and engine vibration may be contributing to the problem. |

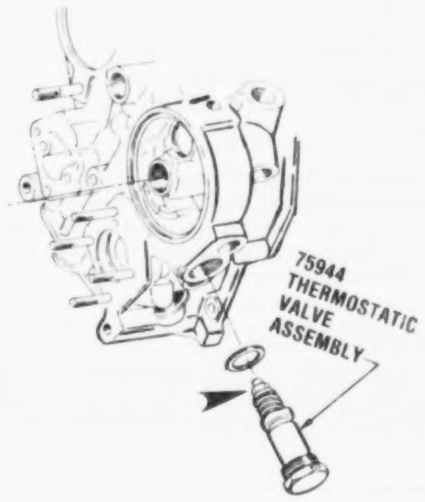
GOOD JUDGEMENT COMES FROM EXPERIENCE, EXPERIENCE COMES FROM BAD JUDGEMENT.

| | | |
|---|---|---|
| Continental Models IO-520, TSIO-520 and GTSIO-520 (except GTSIO-520-F and K) | Fuel Pump Binding | There are recent reports stating the fuel pumps are binding internally and very difficult to turn after the bolts are torqued in accordance with Airworthiness Directive 81-24-06. Submitter suggests the pumps be removed and checked for freedom of rotation after complying with the AD. There are also reports of finding fuel pump seepage on pumps that are outside the serial number range listed in the AD.<br>NOTE: An article and picture pertaining to the problem appeared on page 10 of Alerts No. 31 February 1981. |
| Continental Model TSIO-520N | Plugged Injector Nozzles | One engine on a Cessna 414 quit running during flight. An investigation revealed the plating was flaking off of the fuel injector sleeves and had plugged the injector nozzles. Same condition found on the other engine. Engine time since overhaul - 50 hours. |

## LYCOMING

| | | |
|---|---|---|
| Lycoming Model TIO-540-J2BD (Australian Registry) | Oil Pump Jammed By Foreign Body | During preflight inspection, the pilot was unable to turn port propeller on this PA31. Oil pump gears found locked solid, oil pump body fractured and tooth broken on driving gear. Examination revealed a hard object, possibly threaded (not found) had somehow entered suction side of oil pump. TSN 3151. TSO 1451.<br>NOTE: See item below. |
| Lycoming Models IO-540 and TIO-540 | Valve Assembly P/N 75944 | |

Pilot reported no oil pressure on initial start. Removed accessory case and found two teeth broken off of the oil pump drive gear assembly and one tooth broken off of the crankshaft gear. The oil pump body assembly, was split open in three places. An investigation disclosed the nut, that holds the spring and valve face onto the oil cooler bypass valve assembly had backed off the shaft and fallen into the oil pump gears. The threads on the shaft that holds the nut were rounded off about halfway down into the thread depth. This nut is crimped onto the shaft, which is machined flat on both sides, and apparently in the crimping operation the threaded portion of the nut is enlongated which does not allow the nut to grip the threads on the shaft throughout the entire depth of the threads. Engine vibration and spring pressure possibly caused the nut to loosen after a period of time. There are reports of the temperature control valve assembly nut being loose causing fluctuating oil temperatures. Two reports advised the nut was off of the stem and could not be found. This problem may exist on other models of Lycoming engines.



## PRATT & WHITNEY

| | | |
|---|---|---|
| Pratt & Whitney<br>Model R-1340 | Flyweight Liners | Recently a propeller on a R-1340 engine shed a 16 inch long piece from the propeller blade tip. The engine was recovered with little crash related damage. The propeller was replaced and the engine was run in an engine test stand to determine the cause of the blade failure. This test showed abnormally high alternating stresses in the propeller blade. Subsequent engine disassembly, showed excessive wear on or in the flyweights and flyweight liners. |

## SOMETHING TO THINK ABOUT

### AIRCRAFT TIRE CARE

With the onset of summer the high temperatures will be more detrimental to aircraft tires. Maintaining the correct inflation pressure in an aircraft tire is one of the most essential factors in obtaining maximum safe service life. Inner tubes and tubeless tire liners used in most automotive tires are made of butyl rubber. Most aircraft inner tubes and tubeless tire liners, on the other hand, are made of natural rubber to satisfy extreme low temperature performance requirements. Natural rubber is a poor air retainer when compared with butyl rubber. This accounts for the comparatively high daily air pressure loss and need for frequent pressure checks with aircraft tires.

Daily inspection of tires includes checking the pressure. This can only be done properly with calibrated gauges. Don't let an improperly serviced tire cause an aircraft accident/incident or personnel injury. Ensure that tire servicing equipment is in good working condition and properly calibrated.

### INSECTS, BIRDS, AND AIRCRAFT

Insects and their nests, although infinite in size when compared to an aircraft, are a constant hazard to the safe operation of aircraft during warm weather. Their existence in such locations as fuel tank vents, airspeed masts, breather pipes, etc., creates an obstruction in the relatively small openings which provide air that is vital for the satisfactory operation of the various systems installed in the aircraft. If undetected, the obstruction usually becomes quite evident after the aircraft is airborne, and the powerplant or system operates erratically or fails completely. On too many occasions, this occurs each year and an accident or incident results.

The title of "hazard" may also be applied to the existence of birds' nests in such locations as the carburetor air intake system or the inside of the engine nacelle. Birds' nests inside the carburetor air intake opening in the cowling can easily be ingested into the intake system and lodge against the carburetor screen. At this point they effectively obstruct the flow of air to the carburetor venturi, and as a result, a considerable power loss is experienced immediately. Nests in the engine nacelle may either disrupt the flow of air cooling the engine or become a fire hazard if they come in contact with the hot exhaust manifold while the engine is operating.

Good preventive maintenance and attention to detail during the preflight inspections will effectively stop insects and birds from becoming hazards. Even though the aircraft may have been parked for only a couple of hours, it pays to give these conditions a recheck.

A MINUTE FOR SAFETY IS BETTER THAN A MONTH FOR REPAIRS.

## AIRCRAFT FLEXIBLE FUEL HOSES

The fire shield was removed from the oil cooler inlet hose while searching for an oil leak. The hose broke in two pieces when the hose was straightened. The inner tube of the hose had hardened to a glass-like consistency. This recent report listed the hose total time as 2,271 hours.

The following is a reprint from the 1976 General Aviation Inspection Aids Summary.

Numerous reports of fluid carrying flexible hose failures have been received. The reports indicated these hoses are generally located in the engine compartments of various model aircraft and include the wire-braided types supplied by Aeroquip and Stratoflex, etc. As these hoses are fabricated from synthetic rubber, their finite service life depends on factors such as age, shelf life, temperature (ambient and fluid), and other environmental conditions.

To assure continued hose integrity, it is suggested the following inspection procedures be accomplished after each 100 hours of operation:

1. For those aircraft having an auxiliary fuel pump, pressurize the flexible fuel lines with the fuel boost pump operating in high position. The fuel system of certain models of aircraft equipped with fuel-injected engines can be pressurized by activating the electric primer.

2. Examine the hose exterior for evidence of leakage or wetness.

3. Inspect for discoloration of the hose and/or color bleaching of the end fittings.

4. Check the hoses for evidence of stiffness.

5. After pressure testing, allow sufficient time for excess fuel to drain overboard before attempting to start the engine.

6. On those aircraft having a gravity flow fuel system, the inspection procedures in steps 2, 3, and 4 apply.

It is suggested that any flexible hoses which are found leaking or which show a notable amount of stiffness be replaced. It is further suggested that all flexible hoses carrying flammable fluid in the engine compartment be replaced at engine overhaul or every five years, whichever occurs first. The aircraft manufacturer's service information, however, should always be followed if different from the above procedures.
During reinstallation of flexible hose assemblies, consider the following precautions:

1. Assure the hose is not twisted. High pressures applied to a twisted hose can cause failure of the hose or loosening of the B-nut.

2. Provide as large a bend radius as possible; however, never use a bend radius less than the minimum specified by the hose manufacturer.

3. Do not attempt to straighten a hose having a bend in it as this could result in damage to the hose. Rubber hoses will take a permanent set during extended service periods. Care should also be taken during removal and reinstallation of such hoses to assure they are not bent excessively and that they are returned to their original position.

## BATTERY COVER

The pilot complained of fumes in the cabin of a Cessna 172P. An investigation revealed battery acid on the firewall, engine mounts and accessory case. The battery cover had been put on too tight which distorted the battery case. The cells shorted resulting in acid boil over. Submitter advised that this was the second Gill PS12-11M battery found in this condition. This could apply to other batteries in other aircraft. Be aware when installing the battery cover.

## BOLTS WITH LUBE PASSAGES

Bolts that have been drilled to provide a passage for lubricants are frequently used at such locations as torque links and gear attach pivot points on many makes and models of aircraft. The loads these bolts are subjected to in service are usually great, and when a failure occurs, major damage generally results. Periodically, incidents of this nature are reported, and in the subsequent investigation, it is not uncommon to find the bolt had been partially cracked for some time prior to the complete failure. There is a good probability that if these bolts had been carefully examined at intervals commensurate with the type of operation involved, evidence of the impending failure would have been found.

An analysis of the reported data showed that the failure patterns for these bolts were rather uniform. The cracks originated at the grease outlet hole in the bolt shank and extended lengthwise in either direction or transversely around the shank. In some cases the cracks developed adjacent to the bolt head. Failure patterns of this kind have also been found on certain types of tail wheel axles.

To maintain product safety and reliability by avoiding a complete failure, it is suggested that bolts of this type be given a dye penetrant or magnetic particle check when the inspections required by FAR 91 are conducted.

Reprint from 1976 General Aviation Inspection Aids Summary.

## CARBURETOR AIR BOX ASSEMBLIES

Inflight operational difficulties, which have been attributed to deteriorated carburetor air box assemblies, continue to be reported.

It is suggested that the following be included as part of the usual maintenance procedures when performing periodic inspections in the powerplant area.

1. Examine the entire air box assembly for cracks and security of attachment to the carburetor.
2. Inspect the actuating controls for cable wear, cable housing tightness, and wear at the control arm attach point.
3. Examine the air box valve assembly and all associated parts including bushings and bearings for wear, security of attachment to the shaft, and edge seal for deterioration, etc.

## PAINTING CONTROL SURFACES

When repainting the control surfaces of an aircraft, the manufacturers recommended procedures should be followed. Some manufacturers require rebalancing the control surface only after repair and painting, while others require rebalancing if the surface is to be repainted without stripping. By not following the manufacturer's recommended procedures, flutter can develop in the control surface, causing an unsafe condition. This could also result in unnecessary maintenance.

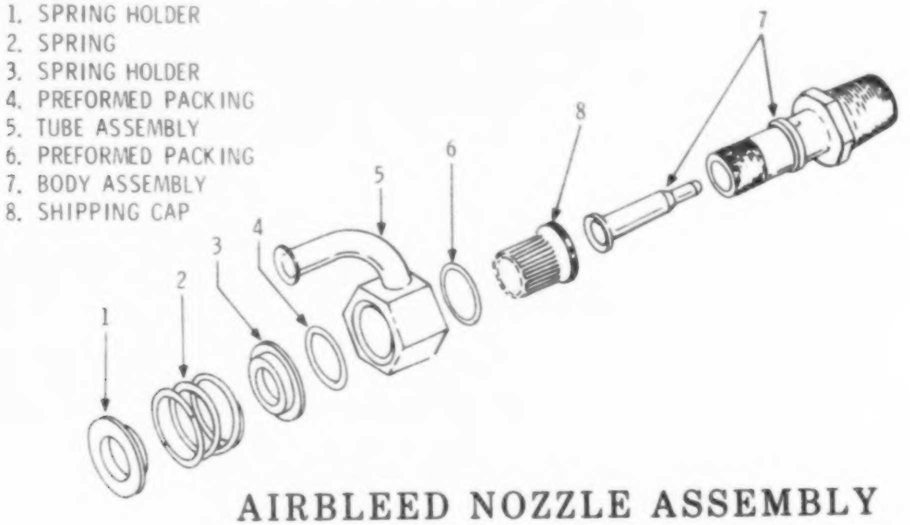
## CLEANING PROCEDURE FOR THE TWO-PIECE AIRBLEED INJECTOR NOZZLE

Remove fuel line union nut from nozzle.

Remove fuel restrictor from nozzle body. It is not neccessary to remove nozzle body from cylinder. Clean restrictor in M.E.K. or acetone. Do not clean any internal passages with any sharp instrument such as drills, pins, needles, etc. Use air pressure to clean nozzle body in cylinder.

Reinstall the airbleed nozzle assembly as directed in Bendix Service Bulletin RS-77 or Avco Lycoming Service Instruction 1414. Particular attention should be given to the torque values specified. These are:
Nozzle in cylinder - 60 pounds-inches
Fuel line to nozzle - 25-50 pounds-inches

NOTES: 1. Care should be taken to avoid dropping the fuel restrictor.
2. Keep each restrictor with its respective nozzle body.


1. SPRING HOLDER
2. SPRING
3. SPRING HOLDER
4. PREFORMED PACKING
5. TUBE ASSEMBLY
6. PREFORMED PACKING
7. BODY ASSEMBLY
8. SHIPPING CAP

AIRBLEED NOZZLE ASSEMBLY

AVCO LYCOMING FLYER

## TYGOTHANE TUBING

Use of tygothane tubing in jet aircraft fuel tanks has resulted in refueling problems plus contamination of the fuel tanks and systems as the tubing starts to deteriorate. The tygothane tubing seems to have a service life of approximately 5 years depending on the exposed temperature of the wing tanks. If your aircraft has any of this tubing installed, it is recommended that an inspection be made to determine its condition. If it has turned from tan to brown in color, this material should be replaced.

| Some of the known aircraft utilizing this material are: | CORRECTIVE ACTION |
|---|---|
| Falcon 20 modified by STC SA1851WE | SB 2801 |
| Hawker Siddeley DH125 modified by STC SA3382WE | SB 2802 |
| Lockheed Jetstar 1329 modified by STC SA2603WE | SB 2804 |
| Lockheed Jetstar 1329 modified by STC SA3821WE | SB 2805 |
| Lockheed Jetstar 1329 modified by STC SA3324WE | |

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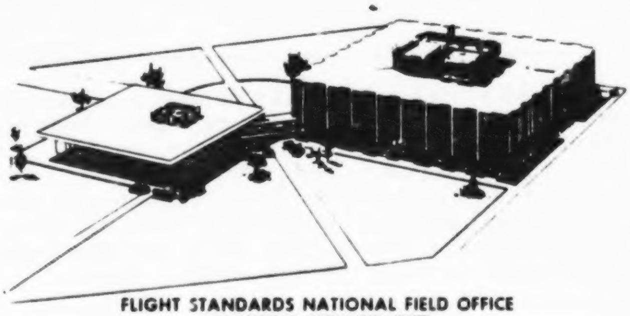
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

ADVISORY CIRCULAR
AC 43-16

# GENERAL AVIATION AIRWORTHINESS ALERTS

JUNE 1982



FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

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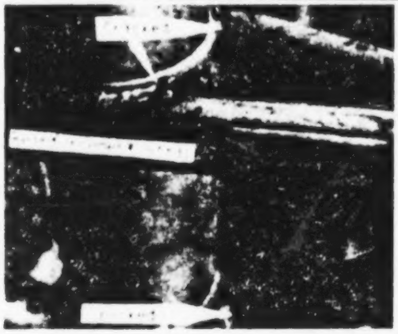
## AIRCRAFT

## BEECH

Beech
Model D18S

**Broken Gear Brace**



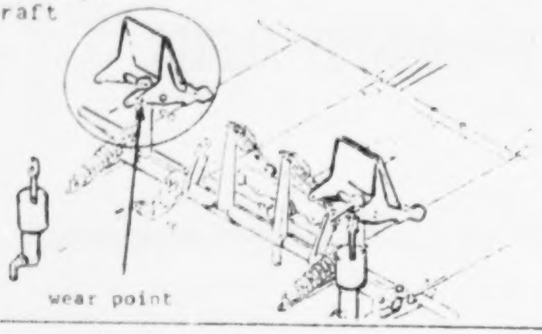
The left main gear top horizontal brace was found broken at the inboard attach point. The outboard diagonal brace was cracked at the lower attach weld. The forward horizontal brace was broken at the outboard weld on the cylinder assembly. No cracks were found in the cross brace reinforcement strap. Aircraft time - 8,550 hours.

Beech
Model B55

**Nose Tire Rubbing**

The nose tire was found rubbing the right nose gear door retract bellcrank and rod. A hole had been worn through the retract rod boot. This condition exists when using the Flight Custom II tires.
NOTE: A related article appeared in Alert No. 36, July 1981.

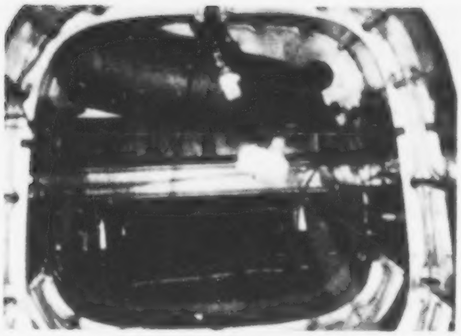
# CESSNA

| | | |
|---|---|---|
| Cessna Single-Engine Aircraft | Rudder Pedals<br><br> | The holes in the rudder pedals, which are used to attach the brake master cylinders, are being found excessively worn. In several instances, the hole has torn out causing loss of braking.<br>It is recommended that the rudder pedal/cylinder attach point be checked at each required inspection. |
| Cessna Models 150/152 Series | Rudder Cables | Numerous reports have been received of the rudder cables being found frayed where they pass over the last set of pulleys. Other locations where the cables have been found frayed are at the fuselage aft bulkhead and at the cutouts where the cables exit the fuselage skin just forward of the rudder horn. |
| Cessna Model 172 | Elevator Cable P/N 0510105-41 | The up elevator control cable was found rusted, very stiff and strands broken at the elevator end fitting. The submitting mechanic advised the cable end is difficult to see but should be inspected each 100 hours and lubricating the cable each 100 hours will prevent the rust problem. Aircraft time - 1,348 hours.<br> |
| Cessna Model 172RG | Main Landing Gear Tire Pressure | Section 8 of the Pilots Operating Handbook/Airplane Flight Manual for the 1980 and 1981 model year airplanes erroneously lists the inflation pressure for the main gear tires as 38 psi. The correct inflation pressures should be 60 to 68 psi. |
| Cessna Models 177 & 177RG | Wing Spar Cap Corrosion | Cessna Single Engine Service Information Letter No. SE80-102 outlined inspection and repair procedures for corrosion damage to the wing upper spar caps of 1977 and 1978 model year airplanes. There has been a recent report of similar corrosion damage found on a 1968 model year airplane.<br>It is recommended that all Model 177 and 177RG airplanes be checked for corrosion in accordance with procedures in Service Letter SE80-102. |

Cessna
Model R182

Broken Oxygen
Bottle Bracket

The oxygen bottle was found on the rudder and elevator cables during an annual inspection. The cylinder mounting brackets were found broken. The broken brackets allowed the cylinder to fall to the bottom of the fuselage causing cable interference. The pilot/owner was unaware of the situation and had not experienced any aircraft control problems. Aircraft time - 488 hours.



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Cessna
Model TR182
Aircraft

Nosewheel Tire
Heat Shields

Cessna has developed a heat shield for installation in the nose wheel well to protect the nose gear tire from excessive heat radiated from the engine exhaust system when the nose wheel is retracted. These heat shields are now being installed on production line airplanes at the factory.

Cessna Single Engine Information Letter No. SE82-1 provides details for field installation of these shields on airplane serial numbers R18200584 thru R18201849.

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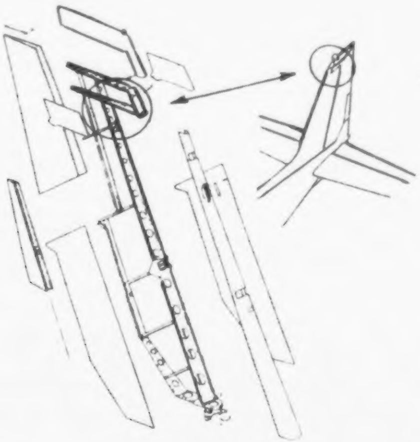
Cessna
Model 335
& 340 Series

Rudder Tip Rib Assy
P/N 0831311-1



Several reports have been received concerning cracking of the tip rib which supports the rudder balance weight. Removal of the fiberglass cover for inspection may reveal some damage, but cracks can also be present under the balance weight. It is suggested that the balance weight be removed and the tip rib checked for cracks at the next scheduled inspection. If any cracks are found during these inspections, please submit an FAA Malfunction or Defect Report.

Cessna is currently planning a change in the design of the balance weight attachment rib. This change will be incorporated into new airplanes at the factory. In addition, a Service Information Letter announcing the availability of the new design rib (P/N 5331004-2) for in service airplanes was scheduled for the end of April 1982.

---

Cessna
Model 404

Chafed Fuel Line

The left engine quit running during cruise flight. The engine was restarted by using crossfeed. An investigation revealed a hole in the left inboard fuel cell fuel supply line. The line had been chafing against a fuel tank brace. When the fuel quantity in the cell decreased below 30 gallons, air entered the fuel supply line which caused the engine to quit running. Total aircraft time - 2,040 hours.

## CONSTRUCCIONES AERONAUTICAS

| | | |
|---|---|---|
| Casa<br>Model C-212 | Cut Seals | The aircraft could not be held on a straight line during taxi. The steering preselector was removed and all the O-rings on the piston were found cut. The cut O-rings allowed fluid leakage which moved the piston back and forth. The port holes in the preselector body had sharp edges which had cut the O-rings. |

## EMBRAER

| | | |
|---|---|---|
| Embraer<br>Model EMB-110P1 | Bellcrank Assembly | The rear cargo door latch would not close. An investigation disclosed a broken bellcrank assembly. There have been other reports of this problem. One report advised the aft door latch handle was jammed in an intermediate position. The door would not open or close. The upper aft door lock bellcrank assembly was broken at the rod end connecting point. |
| Embraer<br>Model EMB-110P1 | Broken Flapper Valve | Two recent reports advised of low air flow through the air conditioning distribution ducts. Investigation revealed the flapper type check valve in the ground blower inlet duct had broken at the mounting pins. One report stated pieces of the valve were dispersed through the air conditioning system with pieces lodged in the blower motor which caused destruction of the ground blower unit. Aircraft times - 493 and 961 hours. |
| Embraer<br>Model EMB-110P1 | Dirty Switch | The right main gear would not indicate down and locked when the gear was selected down. An investigation revealed the downlock microswitch was contaminated with dirt, sand and ice. The system checked normal after the downlock actuator microswitches were cleaned and lubed. |
| Embraer<br>Model EMB-110P1 | Worn Bearing | Aircrew reported rudder vibration above 140 kts which became more severe at higher airspeeds. An investigation revealed the rudder trim tab actuating rod end bearing was excessively worn. Replacement of the rod end bearing eliminated the vibration. Aircraft time - 1,070 hours. |

AN OUNCE OF PREVENTION IS WORTH TONS OF FIRE EQUIPMENT

## GATES LEARJET

Gates Learjet Models 24, 25, 28, 29, 35, and 36 Aircraft - Bleed Air Duct Temp Limiters

The following information is contained in Gates Learjet Service News Letter No. 63 dated August 1981:

> "Several cases have been reported where the plastic Bleed Air Duct Temperature Limiter was found melted. This condition usually occurs as a result of prolonged high power settings during ground operation with the Bleed Air System operating. The Duct Temperature Limiter will sense a rising Bleed Air Duct temperature and bias the Hot Air Bypass Valve (H Valve) to the Cold position. During ground operation, however, there is no Ram Air entering the Heat Exchanger to mix with the Bleed Air. The resulting Duct temperatures will surpass the Temperature Limiters design limitations, eventually melting it.
>
> If high power settings are necessary during ground operation, limit the use of the Bleed Air System or restrict the duration of the increased power settings to avoid the described condition."

Aircraft Affected: S/Ns 24-357 and Subsequent, 25-227 and Subsequent, 28-001, and Subsequent, 29-001 and Subsequent, 35-107, 35-113 and Subsequent, and 36-032 and Subsequent.

## GULFSTREAM AMERICAN

| | | |
|---|---|---|
| Gulfstream American Schweizer Model G-164B | Burned Rudder Cables | Two rudder cables were replaced on low time aircraft because of burned spots in the cables. The cables were burned when the battery terminals contacted the cables during removing and installing the batteries. Submitter recommends a CAUTION placard be installed on the battery box to help prevent this problem. |
| Gulfstream American Model 500S | Engine Mount Corrosion | During an annual inspection, a line of corrosion was found where the attach bracket, P/N 5620032-11, butts up against the engine mount assembly. Severe corrosion was found under the bracket when the bracket was removed. The corrosion was believed caused by trapped water between the engine mount and the bracket. The same condition was found on both engine mounts. It was recommended the area be buffed clean and treated with a corrosion preventative compound. |
| Gulfstream American Model 695 | Cabin Door Switch | Two main cabin door switches were reported to have failed in 27 hours of operation on one aircraft. The spring in the switch is the part that failed. |

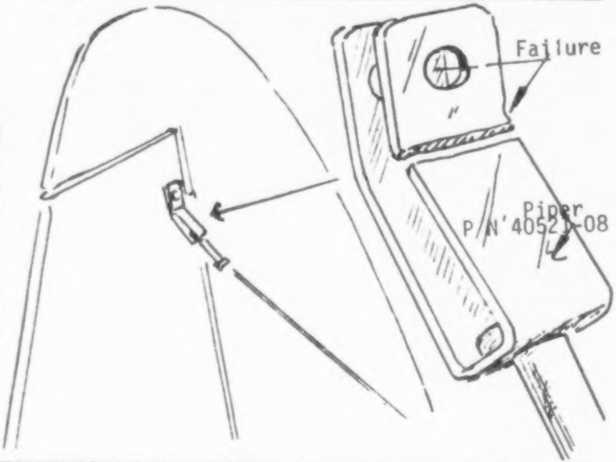
IN ORDER TO ENSURE CONTINUED RECEIPT OF THE "ALERTS," AN ADDRESS CHANGE MUST BE REPORTED TO THE FAA DISTRICT OFFICE UNDER WHICH YOU EXERCISE YOUR CERTIFICATE.

## MOONEY

| | | |
|---|---|---|
| Mooney<br>Model M20J | Gear Motor<br>P/N 102000-1 | The tang on the clutch spring broke making retraction of the gear impossible. Had the opposite tang broken, gear extension would have been impossible. Mooney Service Instruction M20-52 recommends the no-back clutch spring be replaced each 1000 hours. Time on failed assembly - 1,041 hours. |

## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-18-150 | Broken Tail<br>Wire Clevis | The tail wire bracket on the left side of the vertical stabilizer was found broken during a preflight inspection. The part appeared to have been broken for a period of time. Total aircraft time - 112 hours.<br>Another report advised the lower left tail brace wire clevis (P/N 40521-9) was found broken at the horizontal stabilizer. Aircraft time - 87 hours.<br>Airworthiness Directive 81-06-08 pertains to the lower fuselage brace wire attachment. |



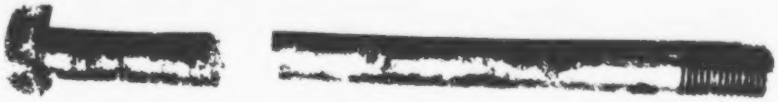
| | | |
|---|---|---|
| Piper<br>Model PA-24-250 | Bungee Arm<br>P/N 20846 | A thumping noise was observed from the right main gear during a retraction test. The landing gear bungee arm assembly was removed and was found broken at the slot. The left gear bungee arm was removed and found cracked. Submitter advised the new replacement parts have greater wall thickness.<br>NOTE: Similar article in Alert No. 43 February 1982. |
| Piper<br>Model PA-28RT-201 | Down Limit Switch<br>P/N 36742-14 | The pilot reported the right gear down light was illuminated when the gear was fully retracted. Water was found in the down limit switch. This was the third switch replaced on the aircraft because of water saturation in 121 hours of aircraft time. |
| Piper<br>Model PA-30 | Main Gear Upper<br>Strut Body | The left main gear strut was observed leaking hydraulic fluid. Close inspection revealed the upper strut body was cracked at the over center spring bracket attach point. Aircraft time - 794 hours. |

## TAYLORCRAFT

Taylorcraft
Model F19

Broken Bolt
P/N AN6-44

This was the second broken engine mount bolt, found by one operator, since Airworthiness Directive 75-18-05 was issued.



## AIRFRAME COMPONENTS

### CLEVELAND

Cleveland
Wheel Assembly

Brake Disc

The brakes failed as the PA-34-200T was being turned into a parking space. Braking action had been normal prior to the turn. An investigation revealed both brake discs had completely separated from the drums. The brake disc and drums were six years old and rust had deteriorated the drums. Submitter recommends the area, where the disc is welded to the drum, be inspected frequently for rust and cracks.

NOTE: Related Article and picture on page 10 of Alert No. 44, March 1982.

## ACCESSORIES

### AIRBORNE

Airborne
Vacuum Pump
Model 441C

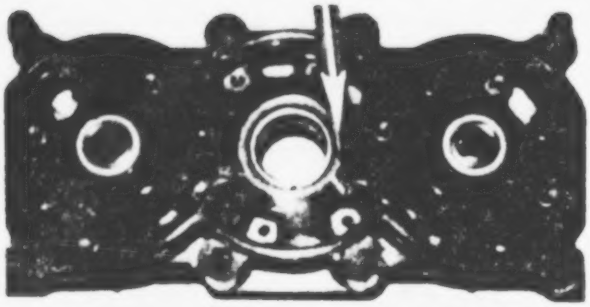
Broken Mount Legs

The four legs that attach the pump to the mounting pad were found broken. The pump was disassembled and the internal parts of the pump were found in serviceable condition. This was the second pump recently found in this condition by one mechanic. This reported pump was on a Cessna T337G and had accumulated 661 total hours. Two of the mounting legs appeared to have had previous cracks.

NOTE: Related article and picture appeared in Alert No. 36 July 1981.

**Bendix Magnetos**

| Excerpts From Recent M or D Reports | |
|---|---|
| D4LN | Repair station reports finding loose rotating electrodes on the distributor gear. The electrode may be tight when inspected and then be found loose after 10 to 15 hours of operation. |
| D4RN | During an investigation for radio noise, the distributor block was found cracked at the bearing boss. Inspection of a new distributor block from stock disclosed it was cracked in the same area. Submitter suspects the distributor blocks crack when the bearing is pressed in place. There have been several recent reports of cracked P/N 10-682010 and P/N 10-382970 blocks. |



| | |
|---|---|
| D4RN | Electrode fingers were loose on both distributor gears causing fingers to rub on distributor block electrodes. Carbon tracking and metal filings caused high R P M roughness. Part time - 500 hours. |
| S4LN | Both flyweight washers were found loose on a remanufactured blue label magneto. Part time - 0 hours. Four recent reports. |
| D6LN | Electrode found loose on distributor gear. Airworthiness Directive 81-12-06 applies to this condition; however the AD does not cover this magneto. |
| D6LN | During compliance with Airworthiness Directive 81-12-06, the distributor block was found cracked between the screws retaining the block to the housing. Three recent reports. Part times - 465 to 492 hours. |
| S6RN | During compliance with Bendix Service Bulletin No. 613, the distributor shaft bushings were found loose in both magnetos. The distributor finger in the left magneto had been striking the electrodes which distributed bronze particles over the inner surface of the block. The magnetos had been inspected 100 hours previously. Part time - 550 hours. |
| S6RN | Distributor block was found cracked, all three mount holes. |

| | | |
|---|---|---|
| | S6RN | During a 100 hour inspection of Beech 58P, all 4 magneto cases were found cracked and unacceptable per Bendix Service Bulletin 533A. Total time - 600 hours. |
| | S6RN | Part number 10-52958 zero time distributor blocks found with 2 of the 3 mounting ears cracked. Sixty percent of distributor blocks in stock found in same condition. |
| | S6LN | Engine developed excessive mag drop with occasional backfiring. Oil was found in the distribuor block and points area. Further disassembly revealed the internal area of the magneto was soaked with oil. It was determined the oil had come through the magneto drive end bearing. |

## CHAMPION

| | | |
|---|---|---|
| Champion | Oil Filter<br>P/N CH48110 | Ten quarts of oil were lost during a 1/2 hour flight in a Cessna TU206F. An investigation revealed the oil and filter had been changed the day prior to the flight. Further investigation disclosed a small hole in the side of the filter. This was the third P/N CH48110 oil filter found with a small hole in the side of the filter. The date code on two of the filters was 1KOG. The third filter had been discarded. |

## EDO-AIRE

| | | |
|---|---|---|
| Edo-Aire Vacuum Pump Model 1U128-002 | Sheared Pin | The roll pin, inside the carbon block, was found sheared after 25 hours of operation. |
| Edo-Aire Vacuum Pump Model 1U128-002 | Sheared Shaft | Three recent reports advised of finding sheared drive shafts at 50 hours of operation. Cause or contributing factors unknown. |

NOTICE TO READERS: THE GENERAL AVIATION AIRWORTHINESS ALERTS ARE, FOR THE MOST PART, PREPARED FROM INFORMATION SUPPLIED BY THOSE WHO OPERATE AND MAINTAIN AIRCRAFT. THE FAA ENCOURAGES THE REPORTING OF ALL MALFUNCTIONS OR DEFECTS THAT COME TO THE ATTENTION OF SERVICE OR OPERATING PERSONNEL, EVEN THOUGH THE PROBLEM HAS BEEN PREVIOUSLY REPORTED. THE MALFUNCTION OR DEFECT REPORT, FAA FORM 8010-4, WHICH SUPERSEDES FORM 8330-2, IS AVAILABLE FROM THE LOCAL GENERAL AVIATION DISTRICT OFFICE, AND MAY BE USED FOR REPORTING PURPOSES.

## SLICK

| Slick Magnetos | Excerpts From Recent M or D Reports | |
|---|---|---|
| | 662 | Pilot reported engine running rough during cruise. An inspection revealed the cam lobes were worn. The points and cam breaker were replaced. Part time - 1,135 hours. |
| | 662 | The distributor block was found loose in the housing. The block was so loose that the electrode on the rotor was wearing the electrodes in the distributor block. It appeared the screws were hitting the bottom of the threaded holes before the block was tight. Part time - 704 hours. |
| | 4201 | The coil was changed in accordance with Airworthiness Directive 81-16-05. The magneto failed after 15 hours of operation. A coil wedge came loose and did considerable damage to the magneto. The wedge had been installed according to instructions but must have bottomed out before the wedge was tight. The "fatter" wedges, supplied with the replacement coil, would not fit. |
| | 4251 | The engine would not start. An investigation revealed the impulse coupling was slipping by the stop pins. Same condition on both magnetos. Part times - 755 and 1,132 hours. |
| | 4251 | The distributor housing frame flange was found cracked on both magnetos at 98 hours operating time. |
| | 4251 | The P/N M3095 frame flange was found broken at the upper mounting point at 336 hours operating time. |
| | 4252 | Oil was observed leaking from both magnetos. An investigation revealed the mounting flange was broken on both magnetos. Total time - 357 hours. The original magnetos were replaced at 606 hours for the same cause - broken mount flanges. |
| | 4281 | The P/N M3114 coils were inspected in accordance with Airworthiness Directive 81-16-05. The coils were found satisfactory and returned to service at 334 hours tach time. At 500 hours tach time the engine would not start. The coils in both magnetos were found cracked. |

**ACCIDENTS AND INCIDENTS WILL NEVER BE PREVENTED - IF THE NEAR ACCIDENTS AND INCIDENTS ARE NEVER REPORTED.**

| | | |
|---|---|---|
| | 4281 | The right magneto was inoperative during engine run. An investigation revealed the P/N M3114 coil was cracked 360 degrees and one wedge was not in place. The magneto name plate indicated that Airworthiness Directive 81-16-05 had been accomplished. Part time - 271 hours. |
| | 6214 | The P/N M3009 coil was found cracked at 116 hours operating time. Airworthiness Directive 81-16-05 does not include this serial number magneto. |

## COMMUNICATION/NAVIGATION EQUIPMENT

### KING

| | | |
|---|---|---|
| King<br>Comm./Radio<br>Model KY-196 | Variable Resistor<br>P/N 133-0134-00 | Three recent reports advised of the R505 volume control creating metal debris which floats inside the radio causing electrical shorts. Two reports stated the fuse, F101, was blown by the dead short. The radios were installed in Embraer EMB-110P1 aircraft. |

## ENGINES

### CONTINENTAL

| | | |
|---|---|---|
| Continental<br>Model IO-520 | Cracked Case | During an annual inspection, a 8 inch crack was found in the upper nose end of the left case half. Time since remanufacture - 240 hours. |

### LYCOMING

| | |
|---|---|
| Lycoming<br>Model TIO-540-J2BD | Broken Coupling Bolt |

The coupling bolt broke after 25 hours total time in service. There were no indications the bolt had been over torqued. The broken bolt allowed the exhaust joint at the wastegate to separate and the hot exhaust burned the oil lines, magneto harness and electrical wiring. Submitter recommends bolt inspection and safety each coupling with several strands of .040 safety wire.

## NATURE VERSUS AIRCRAFT

With warm weather here, it pays to remember that bird, bee, and mouse nests in aircraft are both hazardous and costly. The size and weight of the materials in such nests are completely out of proportion to the size of the problem they are capable of creating. Their presence in aircraft have been known to have caused just about everything from fires in the air to complete engine failures and forced landings. They have been the cause for structural failures that developed because of acidic corrosion from waste matter.

To know that birds, insects, and rodents like to build their nests in aircraft is one thing, and to respect their determination and perseverance is another. In no way should the removal of an existing nest be considered as a victory that assured the displaced tenant would leave the premises permanently. Nor would this action insure against another unwanted guest not beginning construction shortly thereafter. In warm weather, it should never be taken for granted that a nest or the materials for nest will not be unexpectedly loaded aboard an aircraft in a very short period of time. Further, it seems that any opening in an aircraft or its systems is an invitation and/or welcome sign to a bird, insect, or rodent. With this thought in mind, it is possible to then look for other evidence of construction materials peculiar to their natural environment. Some typical examples of this are as follows:

Mud smears or droplets at pitot/static masts, fuel tank vents, crankcase breathers, stall warning vanes, external venturi, and cabin air vents are indications of mud dauber activities.

Straw, string, or blades of grass extending from cowling openings, carburetor air intakes, blast tubes, and exhaust stacks are sign of birds at work.

Cotton batting, shreds of fabric or paper at wheel wells, and empennage openings are frequently indicators that rodents (mice) have been around and possibly moved aboard. Incidentally, they will gnaw on any material, and specialize on digesting wood spars and waxed rib stitching cord.

Each year there are reports of incident/accidents related to bird, rodent, and insect nests in aircraft. The nests are more difficult to find in some aircraft than in others. The Gulfstream American Model AA-5B is one aircraft susceptible to hidden nests as the article below, which was published in Alerts Number 26, September 1980, indicates:

"While waiting for takeoff clearance, the pilot notices sparks and smoke coming from the engine compartment. An inspection revealed a bird's nest on the front side of the exhaust muffler. The cowling, alternator, and starter wires were damaged. The nest could not be seen on preflight inspection."

An investigation to determine the source of smoke and fire in another AA-5B revealed a bird's nest below the alternator and crankshaft area. There is no way to check the area during preflight.

NOTE: The following article, reference the same problem, was published in Alerts No. 13, August 1979:

"Bird's nests have been found between the nose cowl and the engine cowl in the heater duct. The birds apparently enter the area through the propeller opening and go down between the cowling to build their nests. The heater duct is inaccessible to visual inspection without pulling the nose cowl. This problem could apply to other similar Gulfstream American aircraft. The submitter recommends an inspection plate be designed and installed on the front cowl so the area can be inspected. It is also recommended the openings be plugged if the aircraft is inactive, even for a short period of time, during the nesting season."

It is recommended that precautions be taken to prevent nest building but then be alert to the possibility of nests and plugged vents during the preflight inspection.

## CAUTION

### BE AWARE

Two - wing separation in flight accidents - were attributed to unauthorized repairs of previcus damage to the wing spars.

A detailed metallurgical examination of the front spar fracture in one accident disclosed that a fatigue crack had occurred through approximately 90 percent of the fractured cross sectional area of the front spar. The fatigue cracking originated in an area of the 6061-T6 aluminum alloy spar that had been welded, apparently in an attempt to repair previous damage to the spar.

In the other accident, a metallurgical examination of the front spar showed that the spar had failed as a result of extensive fatigue cracking originating in an area of an unauthorized spar repair. The area of the repair had been softened by heat and weakened to approximately half of its original tensile strength.

All repair facilities and general aviation repair personnel should be aware and reiterate the importance of not subjecting critical heat-treated aluminum alloy parts to extensive heat by welding or any other means for any reason. Extensive heat will produce locally a change in internal microstructure which is detrimental to mechanical and fatigue properties.

The importance of following established repair procedures, especially on major structural items such as wing spars, cannot be over emphasized.

### DO NOT PAINT

Disassembly and examination of two Avco Lycoming IO-720-A/B engines revealed a majority of the cylinder base nuts on one engine were under torqued. Further examination disclosed the cylinder boss area under the nuts had been painted.

The Avco Lycoming Overhaul Manual for these engines contains this NOTE - "All machined bosses should be masked before painting. Do not paint under hold down nuts where torque is required."

Emphasis should be placed on the importance of following the established procedures published in manufacturer's engine overhaul manuals.

## OF INTEREST

### ANNOUCEMENT OF AVAILABILITY

SUBJECT: PARTS MANUFACTURER APPROVALS - 1981

PURPOSE. This publication provides a list of replacement and modification parts approved by the Federal Aviation Administration for installation on type certificated products. It is of interest to mechanics, operators of repair stations, and others engaged in altering, inspecting, or maintaining aircraft.

HOW TO ORDER. The current publication entitled "Parts Manufacturer Approvals - 1981" is available at $19 a copy from the U.S. Government Printing Office.

Identify the publication by title and specify stock number 050-007-00598-9

Send a check or money order, payable to the Superintendent of Documents, in the amount shown. Full payment must be received with the order. No c.o.d. orders are accepted.

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# General Aviation Airworthiness Alerts

Alert No. 48
July 1982

AC No.43-16

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**NOTE:**

**"April 1982, Issue No. 45" was inadvertently printed on the cover of the June 1982 issue No. 47. Please check page 1 of your April 1982 supplements to be certain of date and issue, and change accordingly.**

Improve Reliability—
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TD 4. 414:

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ADVISORY CIRCULAR
AC 43-16

**U.S. DEPARTMENT OF TRANSPORTATION**
**FEDERAL AVIATION ADMINISTRATION**
**WASHINGTON, D.C. 20590**

# GENERAL AVIATION AIRWORTHINESS ALERTS

JULY 1982

FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

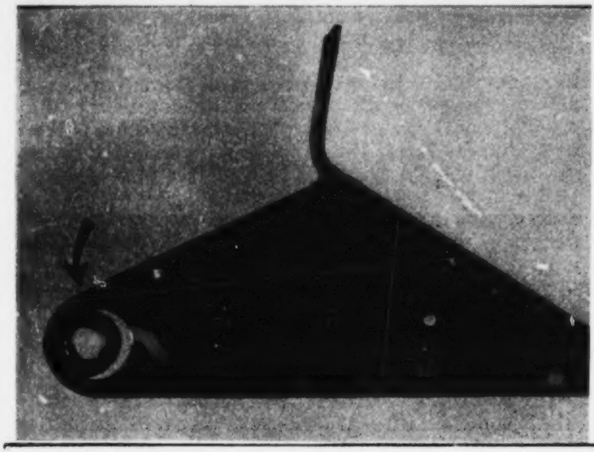
### BEECH

| | | |
|---|---|---|
| Beech<br>Model 77 | Cracked Engine Mount<br>P/N 108-910011-1 | The engine mount was found cracked in two places during a routine inspection. The cracks were where the upper bolts attach to the mount assembly and nose gear installation. This was the third cracked or broken engine mount found by the mechanic who submitted the report. |
| Beech<br>Model 65-A90 | Gear Teeth Stripped<br>P/N 50-801210-1 | There was an unusual noise during gear retraction after takeoff.The landing gear would not fully retract or extend. The emergency system was used to lock the landing gear in the down position. An investigation disclosed the teeth on the landing gear drive spur gear were stripped. Submitter advised the motor and gearbox assembly have a 5,000 hour replacement schedule. There were no records to indicate the assembly had been replaced. Aircraft time - 6,050 hours. |
| Beech<br>Model 95-B55 | Gouged Oil Cooler | A deep gouge was found in the end of the oil cooler. An investigation revealed that an excessively long screw in the right side forward engine cowling had caused the damage. |

## BELL

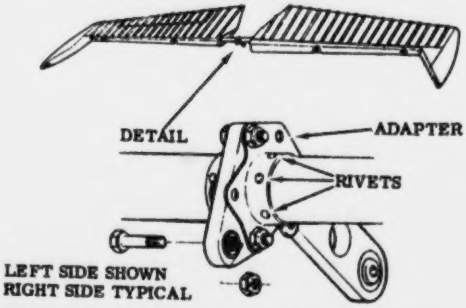
| | | |
|---|---|---|
| Bell<br>Model 222 | Cracked Skin | The fairing on the tail boom was pulled to facilitate servicing the tail rotor gearbox. A 13–inch long crack was found in the upper left tail boom skin. Two of the six stringers were also found cracked. The tail fairing was removed at 500 aircraft hours and no cracks were observed. Total aircraft time – 567 hours. |

## CESSNA

| | | |
|---|---|---|
| Cessna<br>Models 150<br>and 152 Series<br> | Elevator and Trim<br>Tab Assemblies | A number of reports have indicated that various types of service problems have developed in the elevator and trim tab assemblies.<br>It is suggested the following items be checked for evidence of irregularities during each preflight inspection and at every subsequent scheduled inspection.<br>1. Condition of the elevator spar, hinge brackets and bolts.<br>2. Elevator bellcrank wear at the control attach point.<br>3. Condition of the elevator trim tab assembly at the hinge and control horn attach points.<br>4. Bushing wear at control horn/attach points.<br>Repairs and/or replacements should be accomplished in accordance with the manufacturer's service information. |
| Cessna<br>Model 172 | Cap Plate<br>P/N 0523315–1 | Minor surface corrosion was observed on the right wing spar cap plate. The plate was removed and severe corrosion was found. Submitter recommends removal of the cap plate for thorough inspection if there is corrosion on the visible side of the plate. Records indicated this aircraft was manufactured in 1957 and had accumulated 4,219 hours. |
| Cessna<br>Models 172, 180,<br>182, 185, 188,<br>and 200 Series | Elevator Torque<br>Tube adapters | |

There have been several recent reports of finding the rivets, used to secure the adapters to the elevator torque tube, loose or sheared off. This condition can usually be detected by holding one elevator immobile while attempting to move the other. Any movement indicates that looseness is present.

It is suggested that these model aircraft be checked periodically for this problem.



A MINUTE FOR SAFETY IS BETTER THAN A MONTH FOR REPAIRS

Cessna
Model 182

Water In Fuel

Three recent reports advised of engine failure soon after takeoff because of water ingestion. Thorough preflights were performed, which included draining substantial quantities of fuel from the tanks and sump drains, prior to each flight. An examination revealed (1) – tank fuel cap seals were deteriorated which allowed water to enter; and (2) – fuel cell malformation created a well forward and outboard of the sump drains. The wing attitude change during climb apparently allowed the standing water in the well formation to feed directly into the fuel inlet line to the engine.

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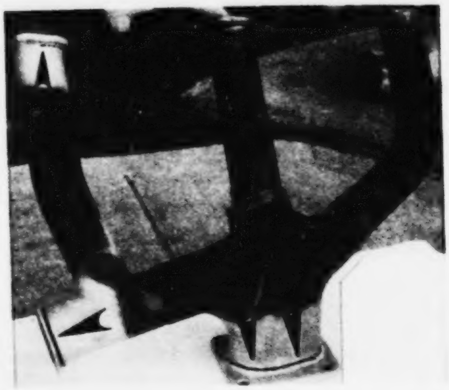
Cessna
Model TR182

Cracked Exhaust
Stack

Three cracks were found in the left exhaust stack assembly. The crack at the turbocharger attach plate left very little material holding the exhaust system to the turbocharger. Aircraft time – 254 hours.



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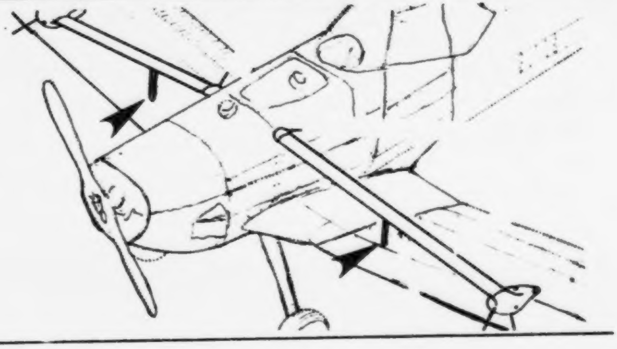
Cessna
Model A188B

Rusted Jury Strut
P/N 1620031-3

A rusted spot was found on the left jury strut. Further inspection revealed both left and right jury struts were full of water. An inspection of other A188B aircraft revealed the same condition – jury struts full of water.



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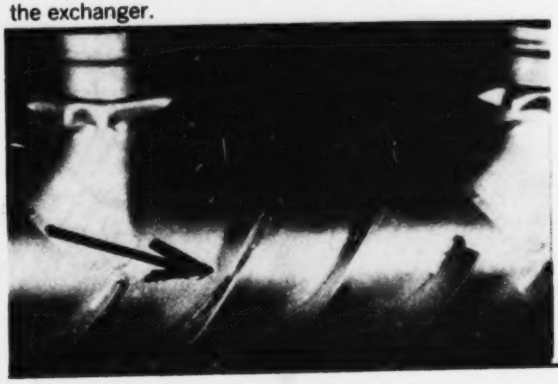
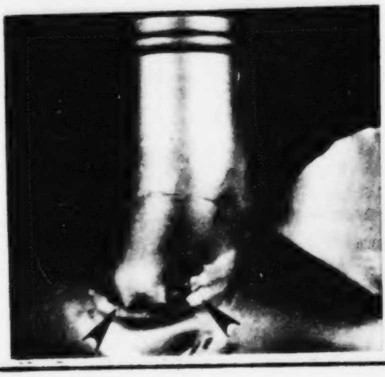
Cessna
Models 206 and 210

Muffler

A repair station reports that cracks are being found in and around the riser welds during muffler rework. These cracks normally would not be seen by a mechanic. The No. 6 cylinder riser is most often cracked. The spiral standoffs on the heat exchanger are also found cracked and in most cases the cracks go into the exchanger.

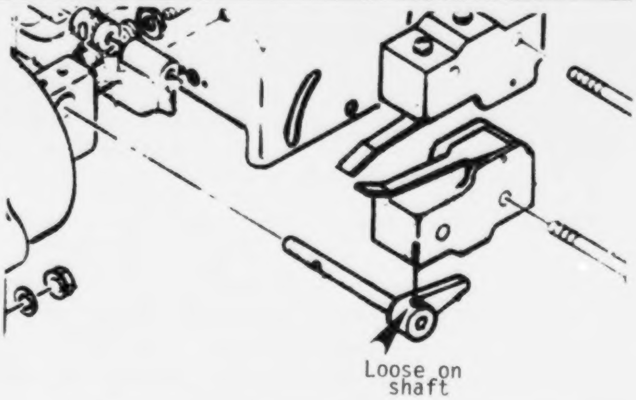




Cessna
Model 402C

Cam Assembly
P/N 5115253-2

The flaps did not fully retract with the selector switch in the full-up position. An investigation revealed the cam assembly was loose on the shaft. The loose cam allowed a change in relationship between the flap limit switch and the shaft. Submitter advised this was the third aircraft with the cam assembly loose. Time on reported aircraft – 76 hours.



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Cessna
Model 404

Landing Gear
Actuator

The O-ring in the main landing gear hydraulic actuator rolls, becomes twisted and cut causing severe hydraulic leaks. Submitter advised of three separate actuators with hydraulic leaks at the piston end of the actuator. The date of one actuator was 1977 and the other two were dated 1980. Weather conditions were not a factor as twisted and cut O-rings occurred during summer and winter. Aircraft time on recent report – 625 hours.
NOTE: Related Article in Alert No. 21, April 1980.

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Cessna
Model 404

Loose Rudder
Balance Weight

During a rudder balance check, it was discovered the rudder balance weight had broken loose from the mount bracket. Aircraft time – 3,707 hours.

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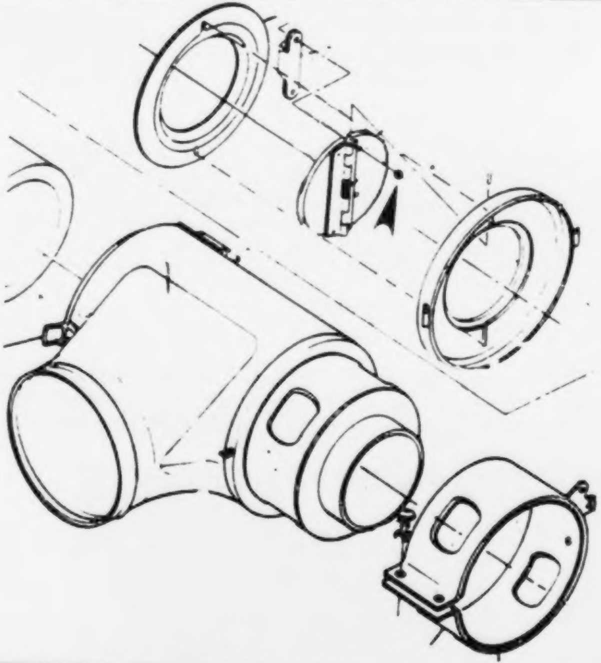
Cessna
Model 421C

Air Inlet Assembly
P/N 5155175-22

The air inlet assembly was removed for inspection of the filter and turbocharger. Upon close inspection of the turboblades, nicks were found on the blades where something had been ingested. Upon looking at the air inlet assembly, it was found that one of the spacers on the hinge pin was missing. The hinge pin is supposed to be staked on the ends. The stake marks are too far to the side of the hinge pin to hold the pin in place. The hinge is mounted in the vertical position. The pin worked its way out far enough to let one of the spacers fall into the turbocharger.

Submitter comments: If this air inlet assembly was turned 90 degrees so the hinge and pin were in the horizontal position and the pin was safetied in a more satisfactory manner, I believe this could have been avoided.



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INFORMED MECHANICS AND PILOTS CONTRIBUTE TO SAFE FLYING

## CONSTRUCCIONES AERONAUTICAS

| | | |
|---|---|---|
| CASA<br>Model C—212 | Steering Directional Valve | The pilot reported excessive play in the nose steering system. The directional valve was disassembled and several O–rings were found cut. The O–rings fit on a spool valve which moves back and forth in a cylinder. The cylinder contains passages drilled at an angle. The elongated holes had sharp edges which cut the O–rings. |

## GATES LEARJET

Gates Learjet Aircraft Equipped with Softflite – Aileron Brush Seal Lubrication

The following information is contained in Gates Learjet Service News Letter No. 66 dated November/December 1981:

> "The maintenance manuals call for the aileron brush seals to be lubricated at each 300–hour interval with a light coat of Dow Corning No. 33 grease. Some maintenance personnel have applied too much grease to the seals closing off the breaks between the seal segments. These breaks are designed to allow water to drain from the seals. When they are blocked with grease, water can accumulate and possibly freeze the seal to the aileron. To prevent this from happening, the breaks between the seal segments should be inspected and cleared of any grease after lubricating the seals.
>
> Operators should also check that the aileron brush seal segments are approximately 1.5 inches in length to provide adequate drainage. If the brush seal segments are too long, additional breaks may be added with a pencil point soldering iron. Assure that proper safety precautions are used if the work is accomplished with the brush seals installed on the aircraft.

| | | |
|---|---|---|
| Gates Learjet<br>Model 35A | Alcohol Filter<br>P/N 6608255–1 | Two recent reports advised of finding the alcohol tank filter assembly totally clogged and corroded. One filter was found restricted 126 hours after installation. The methanol is apparently erroding the aluminum housing. |

## GULFSTREAM AMERICAN

| | | |
|---|---|---|
| Gulfstream American<br>Model GA–7 | Fuel Level Transmitter Float | The left inboard fuel tank gauge was inoperative. An investigation revealed the fiber float block was missing from the fuel tank quantity sender assembly. The float was found in the fuel tank in two pieces. The operator advised this was the second fiber float block to come apart. Aircraft time – 1,158 hours.<br>NOTE: Related Article in Alert No. 39, October 1981. |

## ISRAEL AIRCRAFT

| | | |
|---|---|---|
| Israel<br>Model 1124 | Broken Seat Bolt<br>P/N NAS 1105–34 | A passenger seat back was found loose during an inspection. An investigation disclosed a broken bolt, at the bottom corner under the armrest, where the seat back bolts to the seat structure. Another bolt, P/N NAS 1105–27, was found bent. The bolts appeared to have been loose since new. Aircraft time – 900 hours. |

| | | |
|---|---|---|
| Israel<br>Model ARAVA<br>101B | Cracked Fitting | The altimeter connection was found cracked during a leak check after the fitting was installed. Submitter advised the design of the fitting contributed to the cracking problem during installation. Care during installation and close inspection is required. The operator found another static connection broken at 73 hours total time. |

## MOONEY

| | | |
|---|---|---|
| Mooney<br>Model M20F | Burned Hose | The oil cooler hose chafed and burned at the exhaust stack crossover at the left rear of the nacelle. The hose ruptured and all engine oil was lost. An investigation revealed a wrong type hose had been installed and had been improperly routed over the heat shield. |

## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-23-250 | Cracked Stringer<br>P/N 16210-13 | The bottom aft stringer, adjacent to the stabilator bottom pulley bracket at station 290.49, was found cracked during a routine inspection. No external damage was detected and no cause for the cracked stringer could be found. Loss of stabilator function would have been possible had the stringer cracked and deformed further. Submitter advised the area at station 290.49 should be given special attention at 100-hour and annual inspections. |
| Piper<br>Model PA-28-140 | Cracked Bracket | The aileron bellcrank support bracket was found cracked on two separate aircraft. The cracks radiated from the forward bolt hole. Submitter advised a mirror must be used to inspect the area. With a mirror, the area can be seen through the inspection panel just outboard of the bellcrank. |
| Piper<br>Model PA-28-140 | ELT Wire Chafed | The power wire to the RESCU/88 was found chafed through the insulation and making contact with the metal case. This provided a circuit for the ELT to transmit while in the ARM position. |
| Piper<br>Model PA-28RT-201 | Downlock Hook<br>Spring P/N 67189-00 | |

The nose gear down and locked light was observed illuminating late during a routine maintenance gear retraction check. The condition was more pronounced in the gear free-fall mode. The problem was caused by a stretched downlock hook spring. A new spring was installed and system operation was normal. Aircraft time - 1,229 hours.

Piper
Model PA-28RT-201T

Chafed Oil Return line

The throttle cable steel housing chafes hard against the turbocharger oil return line. Submitter advised of several aircraft found with the line nearly chafed through. Installing a piece of 3/16 I.D. Mil. H-6000 hose or equivalent around the throttle cable eliminated the chafing problem.

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Piper
Model PA-28RT-201T

Gear Lubrication

Two recent reports advised the landing gear would not free-fall and lock in the down position. These were low time-from-factory aircraft (55 and 93 hours) and apparently the landing gear had not been lubricated. Landing gear operation was normal after the gear was lubricated.

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Piper
Model PA-28-235

Sloshing Compound

The engine quit after takeoff at approximately 100 feet altitude. An investigation disclosed sloshing compound was blocking the fuel selector valve port. A small amount of compound was found at the main fuel strainer and at the fuel tank drain. Submitter advises if sloshing compound is found at the fuel strainer or tank drain, or if the compound appears soft in the tank, the entire fuel system should be checked.

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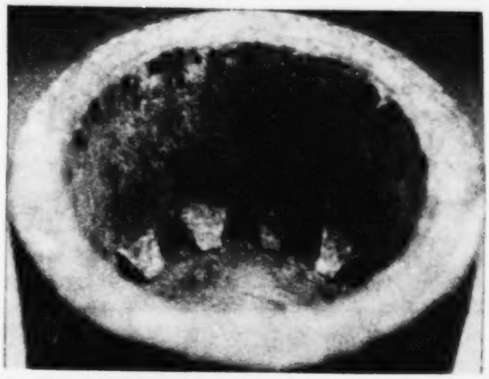
Piper
Model PA-31

Flap Drive Cable

A split flap condition was experienced during the landing phase. An investigation revealed sheared female drive splines on the left flap drive cable at the motor end. The flap drive motor may often be replaced for electrical reasons (brushes, burned armature, etc.) while the female spline in the drive cable continues in service. Airworthiness Directive 82-08-06 pertains to certain PA-31 aircraft.



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Piper
Model PA-31-350

Cracked Tail Pipes

Both tailpipes were found cracked during an annual inspection. The cracks were at the mounting flange to exhaust bypass valve. Time on the tailpipe assembly - 2,196 hours.

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Piper
Model PA-31-350

Turning Limits Exceeded

A 1 1/2-inch-long crack at the shoulder stop in the housing resulted from exceeding the turning radius during towing. Additional hidden damage was found. The torque link attach bolts were bent on both ends and nearly sheared. The cylinder assembly was damaged on top where the steering arm assembly mounts. The three attach bolts were bent and the mating aluminum thread bosses were damaged beyond repair. The cylinder had to be replaced. Submitter recommends disassembly and thorough inspection for hidden damage if there is obvious damage from exceeding turning limits.

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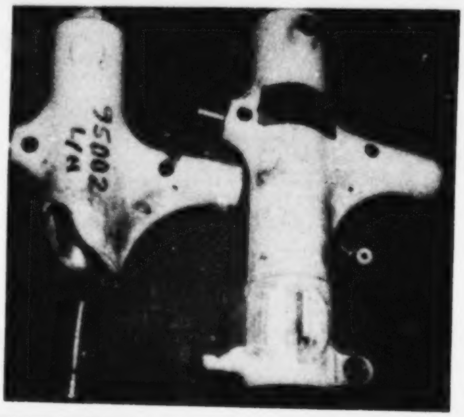
EVERYTHING NEW IS NOT ALWAYS TRUE

| | | |
|---|---|---|
| Piper<br>Model PA-44-180 | Broken Wire | Two recent reports advised of finding the main landing gear down limit switch wires broken at the switch. The wires apparently flex during retraction and extension of the gear. Aircraft times 1,201 and 1,621 hours. |
| Piper<br>Model PA-44-180 | Main Gear<br>Trunnion | The left main landing gear trunnion sheared during landing. An investigation disclosed the trunnion had a horizontal stress crack below the web at the pivot support. A fleet inspection revealed three other aircraft with trunnions cracked in the same area. The aircraft are used for training and times were from 1,546 to 1,800 hours.  |

## SIKORSKY

| | | |
|---|---|---|
| Sikorsky<br>Models S-55<br>and S-62 | Tail Rotor Blades<br>P/N 10-15-2120 | Recently a military HH-52A tail rotor blade fractured. This blade is similar to the S55/S62 tail rotor blade. Investigation revealed intergranular pitting approximately .010-inch deep adjacent to the crack. The manufacturer believes the inspection procedures in SB 62B15-2 and SB 55B15-2 are essential to flight safety and recommend operators diligently follow these procedures. |
| Sikorsky<br>Model S-61 | Defective Nut<br>P/N AN6289-W8 | A previous Sikorsky All Customer Letter CSL-T-79-323 (61-194) advised of an in-flight loss of hydraulic fluid, traced to a cracked jam nut P/N AN6289D8 on the primary servo manifold. At that time it was recommended that this nut be replaced by P/N AN6289-W8 which is 7075T73 material for added resistance to stress corrosion cracking. Recently, a P/N AN6289-W8 nut cracked and resulted in hydraulic leakage identical to the previous "D" nut. Metallurgical examination revealed the nut had not been tempered to the T73 condition. Sikorsky recommends that all operators utilizing P/N 6289-W8 jam nuts inspect daily for indication of cracks or hydraulic leakage. |
| Sikorsky<br>Model S-76 | Electrical<br>Problem | Both DC generators dropped off the line during flight. The ground wires from the DC junction box were grounded at the same point. Submitter recommends separating the No. 1 and No. 2 generator ground wires and grounding at different points. |

IN ORDER TO ENSURE CONTINUED RECEIPT OF THE "ALERTS," AN ADDRESS CHANGE MUST BE REPORTED TO THE FAA DISTRICT OFFICE UNDER WHICH YOU EXERCISE YOUR CERTIFICATE.

KNOWLEDGE IS ONE THING THAT DOESN'T BECOME SECOND-HAND WHEN USED

| | | |
|---|---|---|
| Sikorsky<br>Model S-76 | Upper Link<br>P/N 70104-08021-045 | This upper link uses a NAS 75-8-230 bushing which is recessed up to .020-inch below the surface of the upper link. When the bolt joining the link is torqued, the flange of the SB 5208-102 bearing is pushed into the recess resulting in flange rolling. The flange is 440C stainless steel which does not exhibit a significant amount of plastic flow and which is subject to stress corrosion cracking. |
| Sikorsky<br>Model S-76 | Cam Assembly<br>P/N 76105-08001-041 | The 76105-08003-101 bushing is part of the 76105-08001-041 cam assembly which limits the "up" flap to zero degrees for rotational speeds of zero to approximately 30 percent rotor speed. Service experience has shown that with improper pilot technique or windy conditions that this restriction in "up" flap during run-up or shutdown can result in an impact which may crack the bushing and in some cases prevent the cam from moving freely. A modification to the cam which permits an "up" flap of 3 degrees above the rotating plane is forthcoming. The new cam P/N is 76105-08001-042. |

## SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA226-AT | Pitch Trim<br>Actuator | The pitch trim actuator was noisy when actuated. The central drive gears were completely stripped between the actuating motors. The motors were coming apart and wobbling on their shafts. Time since overhaul - 1,254 hours. |
| Swearingen<br>Model SA226-T | Gear Roller Pin<br>P/N 5453033-1 | During a gear check inspection, the right main gear would not lock in the up position and at times would not extend normally. An investigation revealed the gear up roller pin was broken. One-half of the pin was holding the roller in place. The pin is hollow to allow grease flow. This was the third broken pin found by the reporting repair station. |
| Swearingen<br>Model SA226-T(B) | Melted Static Line | |

The pilot's pitot static instruments ceased functioning during cruise flight. Instruments operated normally after the alternate static source was selected. The pilot's static system was checked with a test box with no indication observed at the static instruments. A visual inspection of the static lines in the cabin overhead revealed approximately 4 inches of the line had been melted. Heat from a heater hose, which was contacting the static line, melted the line. The location was between fuselage stations 206.904 and 226.708 to the right of center. Aircraft time - 855 hours.

# ACCESSORIES

## CHAMPION

| | | |
|---|---|---|
| Champion<br>P/N CH48111 | Oil Filter | Engine oil was lost during the first flight after an oil change and new filter installation. An investigation disclosed oil was leaking from spot welds where the filter torque nut was attached to the filter. Submitter suggests an engine run and a thorough filter check after installation. |

# INSTRUMENTS

## INSTRUMENT AND FLIGHT RESEARCH

| | | |
|---|---|---|
| Instrument and Flight Research | Encoding Altimeters Model E41–25E and E41–34E | There have been several recent reports of the encoding altitude and indicated altitude reading from one hundred to many thousands of feet difference. Other reports advised of sticking needles and needles rubbing on the instrument face. The reports were on "zero" time and low time altimeters. Most of the altimeters were in or were to be installed in Israel Aircraft Industries ARAVA 101B aircraft. |

# ENGINES

## LYCOMING

| | | |
|---|---|---|
| Lycoming Model TIGO-541–E1A | Transition Assembly P/N LW11016 | There have been three reports of holes burned through the turbocharger transition assemblies on PA–31P aircraft. There was damage to the electrical wiring, cowl flap actuators, engine mounts, and cowling. |

## PRATT AND WHITNEY OF CANADA

| | | |
|---|---|---|
| Pratt and Whitney Model PT6A-41 | Oil Scavenge Pump P/N 3024284 | One engine on a Beech 200 was nearly depleted of oil. An investigation revealed internal corrosion had eroded through the external scavenge pump housing. This was the second pump found in this condition. The replacement pump housing had a teflon liner.<br>NOTE: Similar article in Alert No. 15, October 1979. |

# PROPELLERS

## HARTZELL

| | | |
|---|---|---|
| Hartzell Model HC–M2YR | Broken Screws P/N A1595 | The right propeller on a Beech 76 would not unfeather during a training flight. The cylinder was disassembled and the feathering latch mechanism was found broken. It appeared the shoulder screws had broken which allowed the weight to cock and was broken by the cylinder pressure. The shoulder screws appeared to be crystallized. Part total time – 98 hours. |

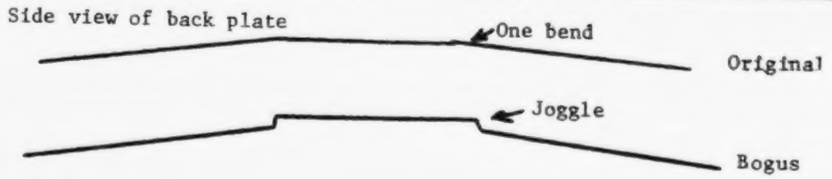
SHARING YOUR EXPERIENCES THROUGH THIS PUBLICATION MAY SAVE A LOT OF HEADACHES AND PROBLEMS FOR OTHER PEOPLE

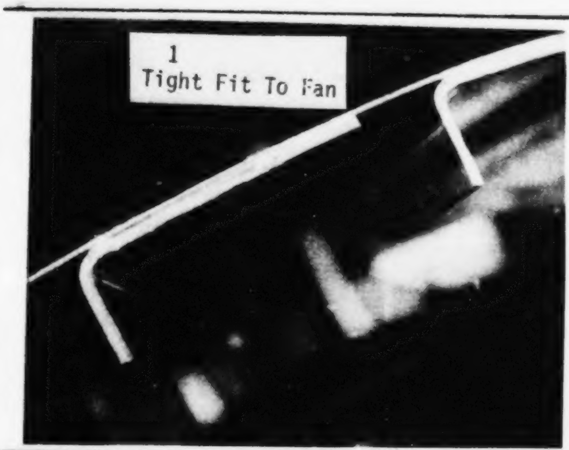
# CAUTION

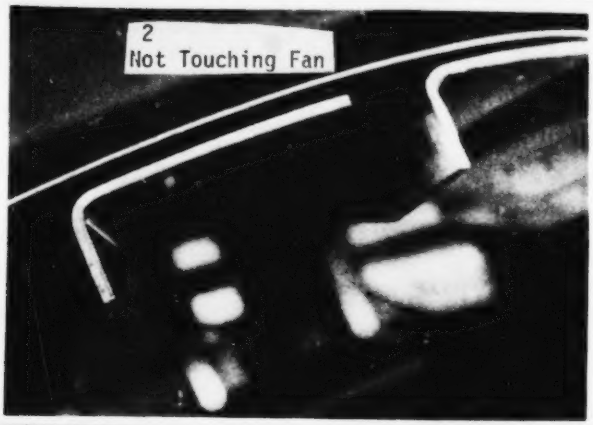
## QUESTIONABLE PARTS

Alternator Fan Back Plate P/N PU-604

There are reports of finding alternator fan backing plates which do not conform to Prestolite specifications.







The backing plate is designed to lay with its periphery against the fan as shown in photo No. 1. The fan's mechanical resonance is dampened which prevents fan breakage.

The design of the center pad of the questionable plate will not allow the plate periphery to lay against the fan as shown in photo No. 2 above. There is no fan dampening and fan breakage may result.

## UNAPPROVED SYNTHETIC FABRIC FINISHING PROCEDURE

Recently, a 100 percent polyurethane primer and paint finishing system for dacron aircraft fabric has been developed and marketed under the trade name, "SuperFlite Durethane System."

Aircraft owners and repair facilities are cautioned that this alternate finishing procedure is not approved under Supplemental Type Certificates (STC) SA 1351WE, SA 2666WE, or SG 10WE held by Ceconite, Inc., for their Ceconite 101, 102, and 103 fabrics, respectively. Further, persons purchasing synthetic dacron fabrics are also cautioned that only FAA approved Ceconite fabrics are eligible for use under the above STC's. FAA approved Ceconite fabrics have "Ceconite 101," "Ceconite 102," or "Ceconite 103" stamped on the selvage at one yard intervals. In addition, Ceconite 101 has three longitudinal marker yarns woven into the selvage for positive identification.

ACCIDENTS AND INCIDENTS WILL NEVER BE PREVENTED – IF THE NEAR ACCIDENTS AND INCIDENTS ARE NEVER REPORTED

## GASKET MATERIAL?

A Continental GTSIO-520 engine was returned to the manufacturer because of internal failure. The engine had been in service 846 hours since factory remanufacture.

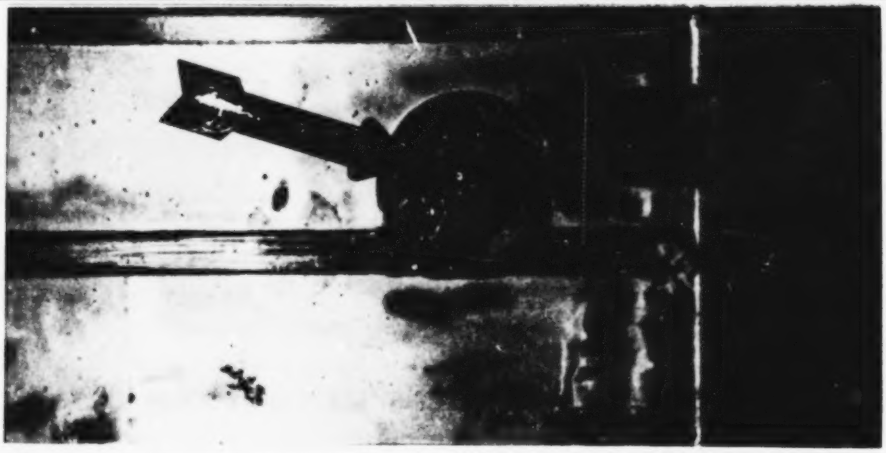
Engine disassembly revealed RTV rubber bearing fragments, two connecting rod cap sections, two counterweight plates, a snap ring and general steel and aluminum debris in the sump.

An oil starvation event had overheated Nos. 4 and 5 crankpins. The No. 5 connecting rod bearings disintegrated. No. 5 connecting rod then released from its crankpin. Portions of No. 5 rod cap appear to have been thrown rearward into the center bay to interfere with the counterweights and No. 4 piston. No. 4 connecting rod cap was torn from its crankpin. Both bolts broke in tensile overload. No. 4 connecting rod had been in severe thermal distress. Its crankpin was discolored and the bearing overheated to the extent of copper removal, steel discoloration, and extrusion.

Silicone rubber had been used as a gasket cement on the oil cooler gasket surfaces, spacer surfaces, on No. 4 and 6 cylinders, the alternator gasket, and the oil pump. The failure occurred less than 1 hour after the gasket was replaced on the oil cooler.

Removal of the left side No. 3 main bearing revealed its oil supply passage to be blocked with silicone rubber similar to that used on the oil cooler gasket surface. The oil cooler gasket and oil cooler surface indicate silicone rubber applied to these areas had broken loose to enter the gallery.

It was concluded that the engine failed due to oil starvation of the No. 3 main and Nos. 4 and 5 rod bearings. The oil starvation was caused by blockage of the oil passage to No. 3 main bearing. The blockage was caused by a silicone rubber material that had been used as a gasket cement on the oil cooler gasket surfaces.
NOTE: See page 13 of Alert No. 35, June l981 for a nearly identical article.



## USE PROPER FLUID

The hydraulic pump seals started leaking 11 hours after the Cessna 210J hydraulic system was serviced with Skydrol.

NOTICE TO READERS: THE GENERAL AVIATION AIRWORTHINESS ALERTS ARE, FOR THE MOST PART, PREPARED FROM INFORMATION SUPPLIED BY THOSE WHO OPERATE AND MAINTAIN AIRCRAFT. THE FAA ENCOURAGES THE REPORTING OF ALL MALFUNCTIONS OR DEFECTS THAT COME TO THE ATTENTION OF SERVICE OR OPERATING PERSONNEL, EVEN THOUGH THE PROBLEM HAS BEEN PREVIOUSLY REPORTED. THE MALFUNCTION OR DEFECT REPORT, FAA FORM 8010-4, WHICH SUPERSEDES FORM 8330-2, IS AVAILABLE FROM THE LOCAL GENERAL AVIATION DISTRICT OFFICE, AND MAY BE USED FOR REPORTING PURPOSES.

## EXERCISE TOWING CARE

The Mooney M20J nosewheel began to vibrate excessively during the landing roll. The nosewheel was held off the runway surface until the airspeed was bled off, then the nosewheel settled back onto the runway. As the pilot tried to turn onto the taxiway, all steering control was lost and the nosewheel collapsed. One propeller blade was slightly bent aft and the engine cowling and nose gear doors received minor damage and scuff marks.

Further investigation revealed the following: The steering horn assembly, P/N 720095–001, had separated from its nose gear attachment and the failed part was later recovered by the pilot. Shaft assembly, P/N 720095–017, which is normally inserted in the above steering horn assembly, was broken at the shoulder but still partially attached to the nose gear truss while the other portion of the shaft had separated from the aircraft with the steering horn assembly. The AN3–7A bolt, was missing where it connects the rudder control tube P/N 915031–003, to the rudder control torque tube assembly, P/N 720005–501. In addition, the right tubular cluster of the nose gear truss assembly, P/N 540014–505, was broken, and also the rod end where it attaches to the left forward end of the nose gear retract rod, was broken.

The pilot stated that earlier he had landed the aircraft at another airport and had witnessed line personnel towing other aircraft with a tug. He was not at the airport when his aircraft was moved approximately 1,000 feet from the original parking spot. The pilot suspects his aircraft was moved with a tug and the steerable nosewheel turning radius limits had been exceeded.

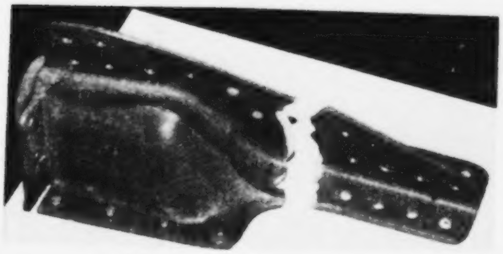
NOTE: The aircraft maintenance manual states the following: "Caution, exercise care not to turn the nosewheel past its normal swivel angle of 14 degrees either side of center. Exceeding the turn limits shown on the turn indicator may cause structural damage."

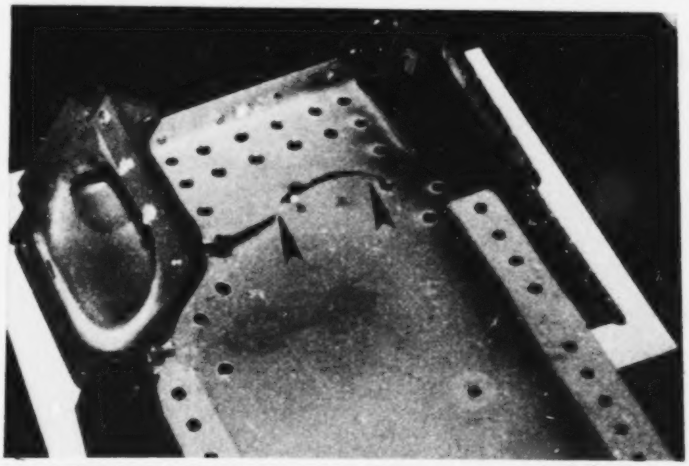
SUBMITTER RECOMMENDATION: Pilots of Mooney aircraft should verbally inform aircraft line and maintenance personnel of possible nose gear structural damage as mentioned in the maintenance manual, should the nose gear turning radius be exceeded.

NOTE: This recommendation would apply to all aircraft with nose gear turn limits.

## HIDDEN DAMAGE

A Beech 35 aircraft had sustained outboard wing damage. The aircraft was repaired and returned to service. Approximately 45 flight hours later, the landing gear was damaged during a landing. No wing damage occurred during the landing gear damage incident. During repair of the landing gear, the top aft spar attach fitting was found broken, the bottom fitting was cracked, and the spar web was cracked. The broken attach fittings had evidence of rubbing together. **An example of hidden damage that can be overlooked.**





AN OUNCE OF PREVENTION IS WORTH TONS OF FIRE EQUIPMENT

☆U.S. GOVERNMENT PRINTING OFFICE: 1982—361-428/2134

U.S. Department
of Transportation

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**Administration**

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Federal Aviation Administration

# General Aviation Airworthiness Alerts

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Alert No. 49
Aug. 1982
AC No.43-16

Improve Reliability—
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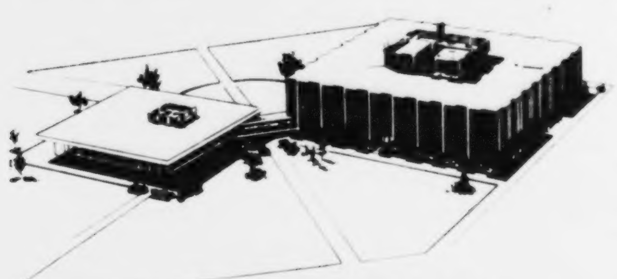
AC 43-16

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

# GENERAL AVIATION AIRWORTHINESS ALERTS

AUGUST 1982



FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

# AIRCRAFT

## AEROSPATIALE

| | | |
|---|---|---|
| Aerospatiale<br>Model AS-355E | Reduction Gear | During conversion of a helicopter from an E to an F model, a large amount of metal flakes was found in the main rotor transmission. An investigation disclosed the epicyclic reduction gear was failing. There were no previous indications from the chip detector. A small amount of metal was found in the filter. Time on the epicyclic reduction gear - 488 hours. |

## AYRES

| | | |
|---|---|---|
| Ayres<br>Model S2R | Wing Ribs | The No. 5 and No. 6 ribs, outboard the right wing fuel tank, broke out around the rivets that hold the upper skin to the ribs. The lower skin and lower side of the ribs were in good condition. One operator has found this condition on two separate S2R R-1820 aircraft. Aircraft time - 2,736 and 4,590 hours. |

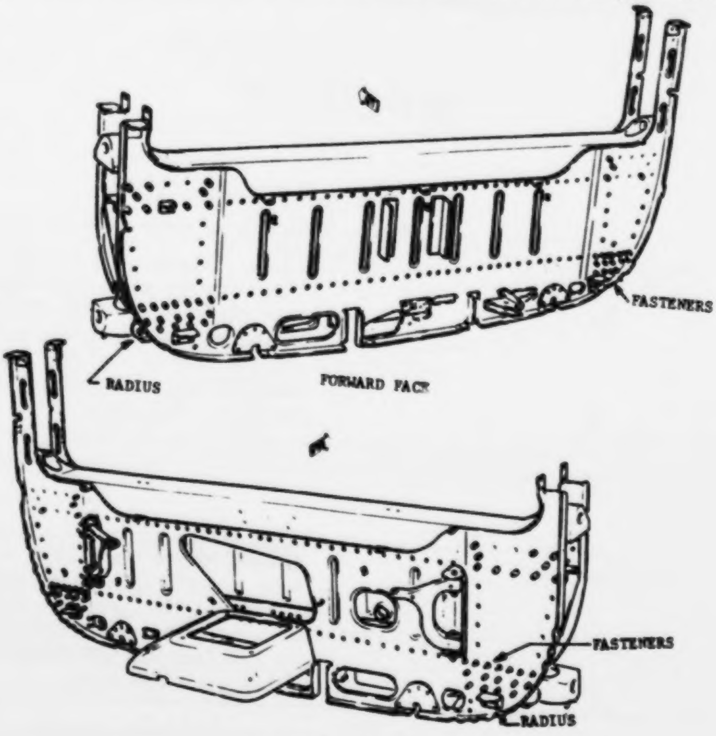
NO INVESTMENT PAYS BETTER DIVIDENDS THAN SAFETY

## BEECH

| | | |
|---|---|---|
| Beech<br>Model C24R | Alternate Air Door Hinge | The alternate air flapper door hinge was found worn to the point of near failure. There is a potential for the flapper door to come loose and block induction air. The worn hinge was aluminum. The replacement part was stainless steel. Aircraft time – 892 hours. |
| Beech<br>Model V35 | Stabilizer Chafing | The aircraft was in for a Smith Speed Conversions stabilizer beef-up kit. Upon removal of the right stabilizer, the right side of the fuselage skin at the leading edge of the stabilizer was found damaged. Severe chafing and abrasion was due to improper clearance of the stabilizer skin. The chafing was a result of movement of the stabilizer leading edge forward of the stabilizer main spar. Inspection can only be accomplished by removal of entire stabilizer from aircraft. Submitter suggests all tails be pulled at annual inspection on a one-time-only basis. |
| Beech<br>Models 55, 56, 58, and 95 Series | Wing Carry Through Structure | |

We have received reports of cracks being found in the wing center section front spar fore and aft webs near the lower forward fittings. The cracks began in the flange radius and from fastener holes. All the airplanes had over 4,000 hours total time in service and a history of rough field operations or landing incidents.

It is recommended that these model airplanes be checked annually for cracks in the webs. If cracking is found, please submit an FAA Malfunction or Defect Report and contact the airplane manufacturer for repair instructions.



FORWARD FACE

AFT FACE

Beech
Model 76

Broken A–Frame
P/N 105–810023–3

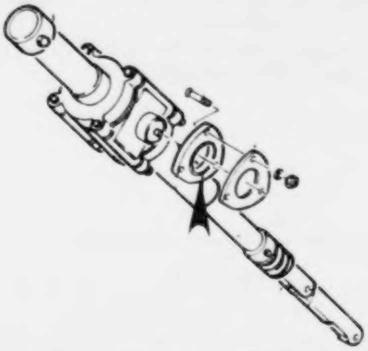
The pilot received a gear unsafe light. Checks were made, and the aircraft was landed without further incident. An investigation disclosed the left main landing gear A–frame was broken below the actuator attach point. There were indications the frame had been cracked for some time, but a chafe strip covered the area making it difficult to inspect. The training aircraft had approximately 5,000 landings.

---

Beech
Model 200

Bearing
P/N B543

The bearing balls were released from the races and damaged the right main gear actuator and support assembly. Submitter advised that if the failure had progressed further, a gear–up landing may have resulted as the support assembly contains the gear actuator mount. This condition was found when the actuator was being removed for the 1,000–hour gear actuator lubrication requirement. Aircraft time – 1,004 hours.



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Beech
Model 200

Duct Assembly
P/N 101–120098–11

There was no braking action for the right brake during a landing. The reservoir was found depleted of fluid. While attempting to service the brake system, fluid was observed dripping from the inboard side of the right wing leading edge. Removal of the wing leading edge revealed the ram air duct had split and was vibrating against the brake line. The vibration had severed the brake line causing depletion of the fluid. Submitter recommends frequent inspection of the duct assembly for cracks. Aircraft time – 2,279 hours.

---

## CESSNA

Cessna
Model 152

Elevator Bellcrank
P/N 0432012–3

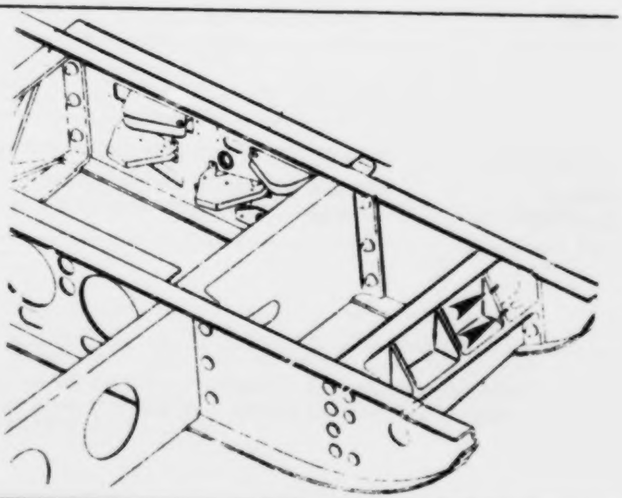
The center bushing in the elevator bellcrank was found worn on two separate aircraft. Aircraft times were 295 and 297 hours.

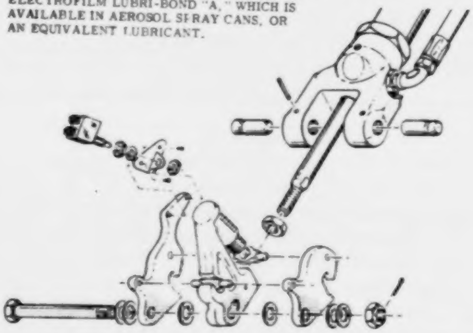
---

Cessna
Model 172

Cracked Gear
Support

Cracks were found in the left and right landing gear support casting during an annual inspection. The hairline cracks appeared to be fresh. The aircraft had not been operating from rough surfaces nor subjected to hard landings. Time on the 1956 model aircraft – 3,087 hours.



| | | |
|---|---|---|
| Cessna<br>Model 177RG | Chafed Hydraulic Line | The gear hydraulic line was found worn through approximately 75 percent by chafing of the elevator trim chain. Aircraft time – 1,683 hours. |
| Cessna<br>Model R182 | Nose Gear Down Lock Mechanism | The nose gear down lock hooks would not lock down. Lack of lubrication was reported as the cause of the problem. A similar article was published previously on Cessna 210-series aircraft. Cessna advised the same procedure and lubricant could be used on the R182.<br><br>SPRAY BOTH SIDES OF SHADED AREAS WITH ELECTROFILM LUBRI-BOND "A," WHICH IS AVAILABLE IN AEROSOL SPRAY CANS, OR AN EQUIVALENT LUBRICANT. |
| Cessna<br>Model 188 | Aileron Cable | The aileron cable was found frayed and nearly broken. The cable had been installed 386 flight hours previously. |
| Cessna<br>Models U206 and T210 | Alternator Mount | There have been two recent reports of finding excessive play in the alternator mount. Reports stated the steel bolts through the aluminum is causing elongation in the aluminum boss. One report listed aircraft time as 495 hours. |
| Cessna<br>Model T303 | Bracket<br>P/N 2541069-4 | The pilot observed an unsafe light for the right main gear. A landing was accomplished without further incident. An investigation revealed that the bracket was torn at the downlock pin hole. The downlock, P/N 2541087-2, was displaced outboard 1/2-inch. The bracket and downlock did not appear to be aligned. Aircraft time – 13 hours. |
| Cessna<br>Model 404 | Broken Bolt | The right outboard aileron hinge bolt was found broken during a pre-flight inspection. There were indications the bolt had been overtorqued. Aircraft time – 456 hours. |
| Cessna<br>Model 404 | Cracked Hydraulic Line | The landing gear had to be blown down after loss of hydraulic pressure. An investigation revealed the left hydraulic pressure line, just inboard of the pressure indicator switch, was cracked in the bend radius. Aircraft time – 1,760 hours. |
| Cessna<br>Model 421 | Lower Rudder Hinge | The lower rudder hinge bracket and the bolt were found broken during an annual inspection. The bracket appeared to have cracked out first, and the aluminum bolt sheared after a period of time. There were no maintenance records indicating replacement of the bolt. Aircraft time – 2,420 hours. |

SAFETY IS AVIATION'S GREATEST ASSET

Cessna
Model 441

Aileron Cables

A repair station reports continually finding worn aileron cables on Cessna 441 aircraft. Both left and right cables are found worn at center wing station 120.411 where the cables pass through fairleads and various pulleys. The right aileron cable, P/N 5715096-65, wears on the pheonolic block on the diverter duct. Broken cable strands are being found at this area. Submitter recommends the right forward aileron cable be routed (raised) for clearance above the conditioning duct and eliminate the guide block.

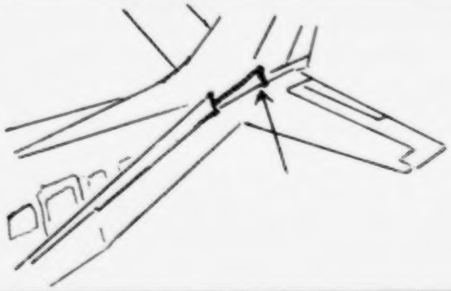
NOTE: Similar article was published in Alert No. 26 dated September 1980 and Alert No. 36 dated July 1981.

---

Cessna
Model 441

Corroded Control
Tubes

The elevator push-pull control tubes were found heavily corroded during a 100-hour inspection. The corrosion was on the aft end lower side of the tubes. The control tubes were replaced. Aircraft time – 591 hours.



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Cessna
Model 550

Aileron Cable

The pilot reported the left aileron jammed in the left wing down position just after takeoff. The aircraft was returned to the airport. The aileron system returned to normal operation upon landing. An investigation revealed the upper cable had jumped out of the pulley groove in the left quadrant assembly. There were rub marks on the upper cable guard assembly which is riveted to the lower portion of the wing upper skin. The clearance between the quadrant assembly and the cable guard was 1/8-inch which allowed the 1/8-inch cable to come out of the pulley. The cable had a permanent set which indicated the cable had been out of the pulley for some time. The cable guard was shimmed down 1/16-inch on recommendations of the factory and a new cable was installed. This aircraft had 1,052 hours total time, and the cable had never been changed.

---

## EMBRAER

Embraer
Model 110P1

Frayed Aileron
Cables

Two recent reports advised of finding excessively worn or frayed aileron cables and fairleads in the left and right wheel wells. Aircraft times were 4,578 and 5,022 hours.

---

NOTICE TO READERS: The General Aviation Airworthiness Alerts are, for the most part, prepared from information supplied by those who operate and maintain aircraft. The FAA encourages the reporting of all malfunctions or defects that come to the attention of service or operating personnel, even though the problem has been previously reported. FAA Form 8010-4, Malfunction or Defect Report, which supersedes FAA Form 8330-2, Malfunction or Defect Report, is available from the local General Aviation District Office, and may be used for reporting purposes.

## GATES LEARJET

| | | |
|---|---|---|
| Gates Learjet<br>Model 35 | Actuator Hose<br>P/N 2307006-131 | All hydraulic fluid was lost during flight. An emergency landing was accomplished without further incident. An investigation disclosed a loose "B" nut on the hose to the retract side of the actuator where the hose attaches to the 45 degree fitting in the wheel well. Further investigation revealed the 45 degree bulkhead fitting had not been aligned with the actuator hose and cycling of the landing gear eventually caused the "B" nut to loosen. Aircraft time - 500 hours. |
| Gates Learjet<br>Model 35 | Thrust Reverser | The thrust reverser deployment had been intermittent. An investigation revealed the bolt that secures the aft side of the P/N 2615203-7 stop assembly was installed below the boss on the stop assembly instead of through the hole. This allowed the stop assembly to rotate up out of position. When this occurred, the arming switches were not in position to start the deployment sequence. Submitter advised that if this condition is found, the power controls, landing gear aural warning, and ignition switches should be checked for operation after the bolt is properly installed. |

## GULFSTREAM AMERICAN

| | | |
|---|---|---|
| Gulfstream American<br>Model AA5B | Aileron Torque Tubes | Movement was observed in the wing flap drive at the inboard support, P/N 5604006-1. Further inspection and disassembly revealed both aileron torque tubes were badly grooved by the P/N 5901005-1 drive bolts in the P/N 5604005-1 arm assembly. Aircraft time - 1,185 hours. This same condition was found on an AA5A aircraft with 350 hours total time. Submitter advised the support assembly ordered from stock had 5/16-inch holes which should have been 3/16-inch. Submitter also advised the chafing can be checked by inserting a .0015 feeler gauge between the aileron torque tube and the end of the bolt. The check can be made through the opened end of the flap torque tube with the flap in the down position. |

## MITSUBISHI

| | |
|---|---|
| Mitsubishi<br>Model MU-2B-20 | Broken Cable |

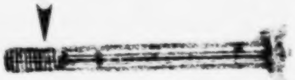
The left gear door would not open to allow the gear to fall during a routine inspection and check of the emergency gear system. An investigation revealed the pin release cable was broken inside the housing. System operation was normal after cable replacement. Aircraft time - 1,552 hours.

| | | |
|---|---|---|
| Mitsubishi<br>Model MU-2B-36A | Engine Mount | During a 100-hour inspection, the right engine right aft vibration isolator was found with the inner sleeve separated from the rubber portion. This was the fourth (4th) recent mount found in this condition by one repair station. There had been no reports of operating difficulties. |

## MOONEY

| | | |
|---|---|---|
| Mooney<br>Model M20J | Fuel Pressure Hose | The fuel pressure hose from the injector to the transducer had become hardened from heat. Fuel was leaking through the hose down on the muffler and header pipes. Aircraft time – 960 hours. |

## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-28-140 | Main Gear<br>Strut Cylinder<br>P/N 65319-03 | A crack was found at the cylinder torque link attach boss during a 100-hour inspection. The aircraft is used for training. Submitter suggests that other aircraft that may be subjected to hard landings be checked for similar failure around the torque link attach bosses. |
| Piper<br>Model PA-28RT-201T | Bolt Threads<br>Stripped P/N AN173-16A | While checking the rudder torque tube attachment and hardware in accordance with Airworthiness Directive 81-12-04, the threads on the upper bolt were found stripped. Aircraft time – 234 hours.  |
| Piper<br>Models PA-28<br>and PA-32 | Fuel System | Improper application of the fuel tank sealant has resulted in the sealant contaminating the fuel system. The contamination can cause blockage at the fuel tank finger strainer, the fuel selector valve ports, the fuel selector valve screen, the quick drain valves, and other places in the fuel system. Operators and others should be alert to indications of soft or peeling fuel tank sealant. Also, see Airworthiness Directive 77-12-01 and be aware that each tank must be selected during pre-flight sumping. |
| Piper<br>Model PA-31-350 | Cracked Turbo Coupling<br>P/N 556 053 | A recent report advised of finding the subject coupling cracked circumferentially 180 degrees from the clamp opening. Airworthiness Directive 79-12-03 R2 pertains to the problem. |
| Piper<br>Model PA-31T | Elevator Control Tube<br>P/N 40847-07 | The bottom side aft area of the elevator control tube was found contacting and wearing on the airframe bulkhead. The control tube was replaced and rub strips were installed on the bulkhead to prevent further wear. This was the second tube recently replaced by one repair station because of wear and deep scratches. Piper Service Bulletin No. 715 pertains to the area. |

| | | |
|---|---|---|
| Piper<br>Model PA-34-200T | Turning Limits Exceeded | The nose gear did not fully retract after takeoff. An investigation revealed the nose gear ground turning limits had been exceeded, causing the steering channel assembly to become misaligned with the nose gear track assembly. This condition allowed the nose gear centering bolt to ride on the outside of the nose gear track assembly. Aircraft time - 244 hours. |
| Piper<br>Model PA-38-112 | Nose Strut<br>P/N 77781-03 | The nose strut deflated during landing. An investigation revealed the nose strut housing was cracked. Probable cause was a hard landing. Aircraft time - 1,072 hours. |
| Piper<br>Model PA-44-180 | Carburetor Air Box | The elbow, at the carburetor air box to the air filter assembly, was found broken during an inspection. Part total time - 294 hours. |
| Piper<br>Model 602P | Duct Assembly<br>P/N 310019-01 | The induction ducts on both engines were found chafing on the engine mounts. The location was approximately 6 inches aft of the fuel servo. Chafe strips were installed on both mounts. Aircraft time - 198 hours. |

## ROCKWELL INTERNATIONAL

| | | |
|---|---|---|
| Rockwell<br>Model NA-265-80 | Wing Flap Actuators | One operator's fleet of 15 Sabreliner 80 aircraft has experienced a trend in wing flap actuator failures. There were 16 failures in 1981 compared to 6 in 1980. Analysis of the failures indicates the predominate problem to be the switches in the actuator distributor box. Average aircraft time - 6,200 hours. |

## SIKORSKY

| | |
|---|---|
| Sikorsky<br>Models S-55<br>and S- 62A | Pitch Control Rod<br>P/N's S10-10-1409<br>and S6210-21007-1 |

A separated brazed joint was found in the pitch-control rod assembly on the main rotor head of a Sikorsky HH-52A helicopter operated by the U.S. Coast Guard. Examination revealed that the amount of brazed area securing the rod end fittings did not meet minimum design requirements. Subsequent investigation revealed that the military control rods were obtained from sources not under Sikorsky quality control and that the braze quality was unsatisfactory.

Recent military procurement of new helicopters as replacement for aged aircraft will undoubtedly result in placing surplus hardware, including these control rods, on the market as spares.

To assist operators of the S-55 and S-62A helicopters, which are affected by these bogus control rods, Sikorsky has issued Service Bulletin Nos. 62B10-9 and 55B10-12 dated April 20, 1982, which contain acceptance criteria for these control rods.

IN ORDER TO ENSURE CONTINUED RECEIPT OF THE "ALERTS," AN ADDRESS CHANGE MUST BE REPORTED TO THE FAA DISTRICT OFFICE UNDER WHICH YOU EXERCISE YOUR CERTIFICATE.

SAFETY IS THE RESPONSIBILITY OF EVERYONE IN AVIATION

## SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA227-AC | Chafed Battery Cable | The flightcrew reported a battery fault indication during flight. An investigation revealed the battery cable in the right wing had chafed through the insulation and made contact with the bleed air tube, P/N 84187-019. Severe arcing burned a hole into the bleed air tube. Two other aircraft in the fleet were found with asbestos wrapped around the battery cable for a chafe pad. |
| Swearingen<br>Model SA227-AT | Nose Steering<br>Actuator | During takeoff roll, the aircraft reacted to false steering commands. The aircraft made two sharp turns to the left. An investigation revealed fibrous material on the nose steering filter screen. Aircraft time - 167 hours. |

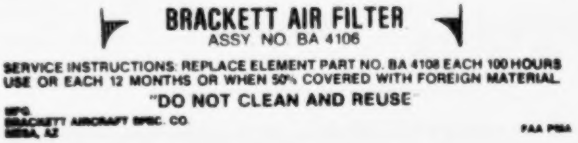
# ACCESSORIES

## BENDIX

| | | |
|---|---|---|
| Bendix<br>Magneto Switch | Defective Switch<br>P/N 10-126690-1A | The key was removed from the magneto switch and the switch indicated both magnetos were in the OFF position. The engine fired as the propeller was pulled through by hand. Airworthiness Directive (AD) 76-07-12 had been complied with each 100 hours. After the incident, the switch checked normal in accordance with the requirements of the AD. The problem was found by using a test light attached to the "P" leads and jiggling the key in the switch. |

## BRACKETT

| | | |
|---|---|---|
| Brackett<br>Air Filter<br>Model BA 4106 | Airflow Direction | The article on page 10 of Alert No. 44, March 1982, was in error. The manufacturer advised the filter does not have or need airflow direction arrows. The filter is designed with the anchor screws only on the downstream side. Apparently, the Brackett "Logo" symbols were interpreted as airflow direction arrows. |



BRACKETT AIR FILTER
ASSY NO BA 4106

SERVICE INSTRUCTIONS: REPLACE ELEMENT PART NO. BA 4108 EACH 100 HOURS USE OR EACH 12 MONTHS OR WHEN 50% COVERED WITH FOREIGN MATERIAL.

"DO NOT CLEAN AND REUSE"

MFG.
BRACKETT AIRCRAFT SPEC. CO
MESA, AZ

FAA PMA

PATIENCE IS SOMETHING YOU ADMIRE IN THE AIRCRAFT PILOT TAXIING BEHIND YOU - BUT CAN'T TOLERATE IN THE AIRCRAFT PILOT IN FRONT OF YOU.

## CHAMPION

| | | |
|---|---|---|
| Champion | Oil Filter<br>P/N CH48111 | The oil filter ruptured and leaked oil during engine run after filter change. There was a 1-inch split in the outside edge of the rolled or stamped base of the filter.<br>NOTE: Similar article and picture on a P/N CH48110 filter appeared in Alert No. 34, May 1981. |

## EDO-AIRE

| | | |
|---|---|---|
| Edo-Aire<br>Vacuum Pump<br>Model 1U128-002 | Sheared Shaft | The dry vacuum pump failed during flight in instrument conditions. An investigation revealed the pump shaft sheared aft of the splined drive end. After removal, the pump would turn freely in both directions when operated by hand. Pump total time - 112 hours. |

## GARRETT

| | |
|---|---|
| Garrett<br>Model TPE331-8 | Oil Filter<br>P/N 76149 |

The oil filter bowl was found loose on a Cessna 441 aircraft. The bowl was removed and the end cap from an old filter was found. The old filter end cap prevented the filter from seating flush. The old cap was removed, new filter installed, and leak check performed.

NOTE: Related article in Alert No. 30, January 1981.

# ENGINES

## CONTINENTAL

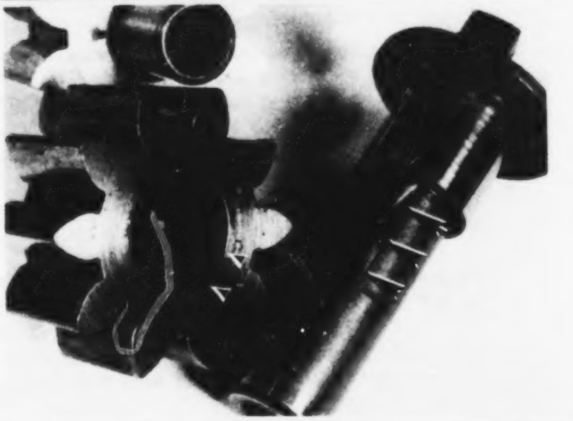
| | | |
|---|---|---|
| Continental<br>Model TSIO-520M | Rocker Boss | The pilot advised the engine was running rough. An investigation revealed both exhaust rocker bosses in No. 6 cylinder were broken and the pushrod was bent. Engine time - 556 hours. |

CHICAGO O'HARE WAS THE WORLD'S BUSIEST AIRLINE AIRPORT IN 1981 - 38 MILLION PASSENGERS

## LYCOMING

| | |
|---|---|
| Lycoming<br>Model O–320 | Oil Pump |

The accessory case was removed for inspection in accordance with Airworthiness Directive 81–18–04. The slot in the oil pump gear was found worn nearly double the normal width. The key in the pump driveshaft was almost sheared. This was the first time the accessory case had been removed since the engine was manufactured. Engine time – 1,997 hours.



| | | |
|---|---|---|
| Lycoming<br>Model TIO–540 | Transition Assembly | Four hours after installation of a remanufactured engine, the turbocharger transition assembly was found cracked along the weld. The crack was progressing toward the exhaust pipe. A new transition assembly was inspected prior to installation and a 1–inch long crack was found along the weld. |

# PROPELLERS

## HARTZELL

| | | |
|---|---|---|
| Hartzell<br>Model HC–B3TN–5 | Blade Separated | The left engine on an MU–2B developed severe vibration during cruise. The engine was shut down and the aircraft was landed without further incident. One propeller blade had separated approximately 6 inches from the hub. There appeared to have been a crack under the deicer boot where the blade broke. Propeller total time – 550 hours. |

# MAINTENANCE NOTES

## AIRCRAFT WHEELS

From January 1976 through March 1982, there were 1,993 Service Difficulty Reports (SDR) and 193 Accident/Incident (AIDS) reports processed which were directly related to aircraft wheel problems.

The majority of the reports stated the failures occurred in the web or flange area. This type failure was prevalent on wheels manufactured by Bendix, B. F. Goodrich, Cleveland, and Goodyear. Wheels manufactured by McCauley indicated a high failure rate in the hub area (52 percent) and in the areas of tapped screw holes.

Wheel separation was reported in 17 percent of the AIDS reports with the majority citing bearing failure as the causal factor.

## CLEAN AND LUBE

In the past 2 years, 113 service difficulty reports have been submitted pertaining to landing gear problems on the Convair 240/340/440 aircraft. In 76 of the reports, the corrective action taken was clean, lube, or adjust; no mechanical malfunctions were found.

## TIRE PROBLEMS

In the past 5 years, tire failure reports have not shown any decrease in problems directly related to tires.

The National Safety Data Systems contain 842 Service Difficulty Reports (SDR) and 286 Accident/Incident Reports (AIDS) where tire failure was a causal factor.

Separation of tread/cap accounted for 43 percent, and 33 percent was due to blown/flat tires as reported by SDR's.

The AIDS reports reveal that 29.5 percent of all tire failures resulted in other damage to the aircraft, and 20.3 percent resulted in loss of control of the aircraft. Loss of control was always related to aircraft under 12,500 pounds.

Considering population by tire manufacturer, the failures are not confined to any particular brands.

The data indicate that more and better inspection of tires would reduce the number of failures.

# CAUTION

## BE CAREFUL

The deice boots were removed from a McCauley propeller on a Cessna T210N to determine the cause of a heating problem. When the blades were cleaned, scribe marks were found along the top, bottom, and around the ends of the boots on two of the blades. The propeller had accumulated 299 hours since overhaul.

## SURPRISE! !

Before takeoff, the cabin door on a Beech 200 was closed, the pins and latch checked, and the door warning light was off. During climb, the door warning light illuminated. The pilot went back to check and when he placed his hand on the door handle, the door came open and departed the aircraft. The door handle remained in the pilot's hand. There was minor damage to the aircraft from the departed door.

Submitter Comments: The door warning system cannot always be relied upon. For positive assurance that a door is latched, an attempt must be made manually toward the open position.

# OF INTEREST

## SPARE PARTS?

Two wing cover plates were found inside a wing fuel tank on a low time aircraft. The fuel tanks had not been opened since the new aircraft was purchased.

GOOD JUDGMENT COMES FROM EXPERIENCE, EXPERIENCE COMES FROM BAD JUDGMENT.

## LYCOMING MODEL CODE FOR RECIPROCATING ENGINES

Each Avco Lycoming engine has a model designation. The designation is made up of a prefix which is a series of letters, a three-digit number, and a suffix which combines letters and numbers. The letters and numbers in this model code have meaning. Most people who fly or work on general aviation aircraft are curious about the meaning of the code, but only a small number thoroughly understand it. Perhaps the explanation and examples provided here will promote a better understanding of what the engine model designations do mean.

| EXAMPLES: | PREFIX | DISPLACEMENT | SUFFIX |
|---|---|---|---|
| | TO | 360 | C1A6D |
| | IO | 540 | AA1A5 |
| | IO | 360 | A3B6D |

L —Left Hand Rotation Crankshaft
T —Turbocharged (exhaust gas driven)
I —Fuel Injected
G —Geared (reduction gear)
S —Supercharged (mechanical)
V —Vertical Helicopter
H —Horizontal Helicopter
A —Aerobatic
AE —Aerobatic Engine
O —Opposed Cylinders

Cubic Inches*

*Note: (541) – A displacement ending in "I" indicates a specific engine model which incorporates integral accessory drive.

A or AA—Power Section and Rating
3—Nose Section
B—Accessory Section
6—Counterweight Application
D—Dual Magneto
(Subsequent changes to models are reflected in the suffix.)

With the information above and a few explanatory details, the Lycoming engine code is not difficult to understand. Starting with the prefix section, an O will be found in the engine designation of all flat opposed cylinder engines. In addition to the O, a combination of the other letters may be used to further describe the engine. The O alone indicates a carbureted engine, but an IO will show that the engine is fuel injected. A further example is the TIGO prefix. Broken down, this says that the engine is (T) turbocharged, (I) fuel injected, (G) geared (which means the prop will run at a lower speed than the crankshaft) and, finally, the (O) for opposed cylinders.

The three-digit number always provides an indication of engine size in terms of approximate cubic inches of displacement. Engines currently in production at Lycoming Williamsport have displacement values of 235, 320, 360, 435, 480, 540, and 720 cubic inches.

The suffix of the reciprocating engine code is a little more complex and the differences signified by each letter or number are not readily apparent. The first characters of the suffix will always apply to the parts of the engine indicated in the examples; in some cases, such as the IO-540-AA1A5, two characters are used to designate one section of the engine. The fourth place in the suffix will usually be a number to indicate a specific counterweight application. Depending upon the need for a counterweight number, a D may be used as either the 4th or 5th character. The D indicates that the engine uses a dual magneto contained in a single housing.

To determine the minor differences in an engine model which are reflected in the model code suffix, it is necessary to consult the engine specification. Most aircraft owners or pilots will have no need for this type of detail. Those who are curious about an engine can get a good idea of its size and character by simply applying the model code information which has been presented in this brief outline.

Avco Lycoming Flyer

---

ATLANTA HARTSFIELD WAS THE SECOND BUSIEST AIRLINE AIRPORT IN 1981 – 37.6 MILLION PASSENGERS

---

LOS ANGELES INTERNATIONAL WAS THE THIRD BUSIEST AIRLINE AIRPORT IN 1981 – 32.7 MILLION PASSENGERS

☆U.S. GOVERNMENT PRINTING OFFICE: 1982—361-428/2199

U.S. Department
of Transportation
**Federal Aviation
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# General Aviation Airworthiness Alerts

**AC No. 43-16**

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# ALERTS

**Alert No. 50
September 1982**

## Improve Reliability-Interchange Service Experience

TD 4. 414:

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ADVISORY CIRCULAR
AC 43-16

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

# GENERAL AVIATION AIRWORTHINESS ALERTS

SEPTEMBER 1982

FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

### AEROSPATIALE

| | | |
|---|---|---|
| Aerospatiale<br>Model AS-355F | Tail Rotor Hub | The tail rotor hub was found loose in the yoke during a daily inspection. The tail rotor mount bolt was difficult to remove. After removal, the tail rotor hub mount bolt hole was found severely elongated, and the bolt was worn and notched. Aircraft time - 353 hours. |

### AYRES

| | |
|---|---|
| Ayres<br>Model S-2R | Broken Bolt |

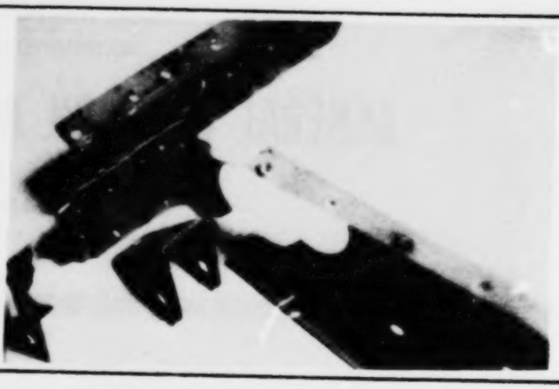
The control stick pivot bolt broke during the takeoff roll. The pilot was able to stop the aircraft without incident. Aircraft time - 1,876 hours.

## BEECH

Beech
Model B90

Elevator Hinge
Attachment

The right outboard elevator hinge attachment was found cracked and broken during an inspection. There was evidence of repair to a previous crack in the attachment. Aircraft time – 5,342 hours.



Beech Models
65, 65–80,
65–88, and
65–90 thru
B90 Series

Main Landing Gear
Actuator Torque Shaft
P/N 50–810240

The right main landing gear could not be fully extended on a Model 65–88 Queen Air during flight and resulted in an emergency landing. The main landing gear actuator torque shaft which raises and lowers the right gear had failed from fatigue which was caused by misalignment of the shaft bearings.

This problem is similar to the one which resulted in the issuance of Airworthiness Directive 81–09–01. It is recommended that the torque shaft be checked for misalignment per instructions contained in Beech Service Bulletin No. 67–27 at the next scheduled inspection unless already accomplished. If any discrepancies are found, please submit details on FAA Form 8010–4, Malfunction or Defect Report.

## BELLANCA

Bellanca
Model 17–30A

Frozen Vent

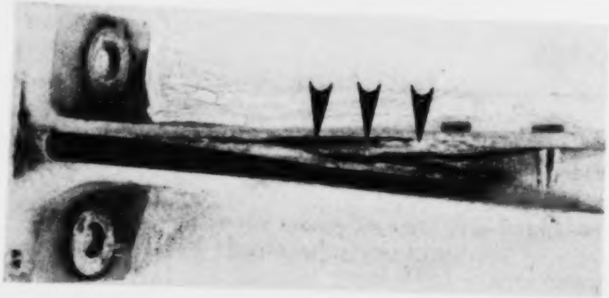
The left inboard fuel tank was leaking. An investigation revealed the cell had collapsed and split. The vent was found frozen with ice and slush which caused the cell to collapse. This incident occurred in January 1982. Submitter recommends a regular check of the vents, especially when operating on slush covered runways.

## CESSNA

Cessna
Model 150

Fitting
P/N 0431009–3

The vertical fin aft fittings were found corroded. The corrosion had progressed to the degree that the rivets were popping out. Records indicate the aircraft was manufactured in 1965.



Cessna
Model 172

Muffler Cracks

There have been two recent reports of cracks at the exhaust pipe flange. The cracks were just above the weld starting point. Aircraft times – 93 and 100 hours.

---

Cessna
Model 172RG

Mounting Bezel
P/N S1843–1

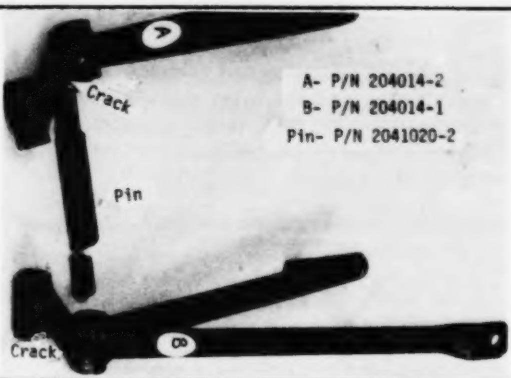
The pilot reported intermittent interruption of electrical power, and the master switch was hard to operate. A new mounting bezel and master switch were installed but did not correct the problem. After several unsuccessful attempts to remedy the situation, the contacting portion of the mounting bezel tabs was cut off. Apparently, the mounting bezel tabs were contacting the master switch rockers.

---

Cessna
Model 177RG

Main Gear Actuator
Support Assembly

The main landing gear would not lock in the DOWN position. An investigation revealed the pin had broken, and the actuator exerted a side load which cracked the supports. The left support had a visible crack 270° around the tube. The right support had a crack 60° around the tube which was detected by dye penetrant. There was no evidence of any problem when the support assembly and pin were inspected during a 100–hour inspection 62 hours previous to the pin breaking. Aircraft time – 2,443 hours.



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Cessna
Model 182

Fuel Cell
Interconnect Hoses

A fuel cell was replaced because of a leak. During fueling of the new cell, a severe leak was evident. An investigation disclosed the vent interconnect line was leaking through the wall of the flexible hose connection. The hose was badly weather checked, and there was evidence of previous seepage. This connection is difficult to check during routine inspection. Submitter advises that if the vent lines are disturbed, the rubber hoses should be checked.

---

Cessna
Model 182P

Adapter Plate
P/N 0721306–1

Both fuel tanks were leaking fuel from the adapter plate. The fuel filler neck on both tanks was found attached with only two rivets. There were locations for six rivets. The replacement units from Cessna had all six rivets installed.

---

Cessna
Model 182P

Vertical Fin
Attach Nuts

During an inspection, three of four nuts on the four bolts that attach the vertical fin to the rear spar were found cracked. Aircraft time – 3,847 hours.

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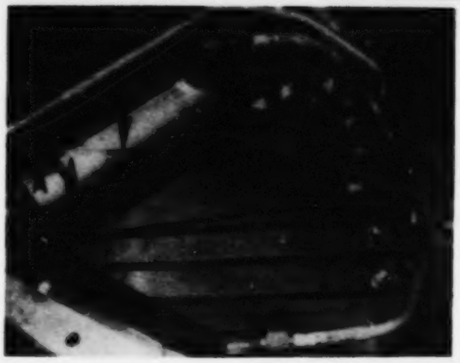
GOOD JUDGMENT COMES FROM EXPERIENCE; EXPERIENCE COMES FROM BAD JUDGMENT.

Cessna
Model 210N

Elevator Trim Cable



An inspection was performed on a new aircraft after being flown from the factory. The left forward elevator trim cable was found improperly routed. The cable was chafing on the left main landing gear actuator assembly. Also, the threads exposed at the adjusting turnbuckle were more than the maximum allowed.

---

Cessna
Model T337G

Emergency Alternator
System

The electrical system ceased functioning during flight. The emergency restart procedures failed to restore alternator operation. An inspection revealed the emergency alternator batteries were not installed. An annual inspection had been recently completed on the aircraft. The submitter interviewed several mechanics who indicated they were not aware of the system. Apparently, the Cessna checklist does not mention these components.

Cessna Service Manual P/N D2516-7-13 contains the following information pertaining to the pressurized 337 aircraft.

DESCRIPTION. The alternator system is equipped with a restart pushbutton switch on the instrument panel located adjacent to the warning lights. Also, four alkaline dry cell batteries, located on the control quadrant support forward of the panel, supply power for the system. Depress the alternator restart switch, and voltage from the batteries is supplied directly to both alternator fields. Alternators will "pick up" a full load using this excitation system without the benefit of the aircraft storage battery.

EMERGENCY ALTERNATOR RESTART SYSTEM FUNCTIONAL TEST. Operation of the emergency alternator restart system should be tested occasionally. Start both front and rear engines, and run at approximately 1500 RPM for several minutes. Turn on all electrical equipment to produce a maximum electrical running load condition. The amber "DIS" light should remain off. Momentarily, turn off all sections of the master switch; then turn on both "ALT" switches. Depress the alternator restart switch for one second. Both alternators will pick up the load. Note that fuel and cylinder head temperature gauges are operating. The system should now be operating without benefit of the aircraft storage battery. If the system fails to pick up the electrical load, as evidenced by no fuel or cylinder head temperature gauge indication, turn off one of the higher electrical loads, such as landing lights or pitot heat, and depress the alternator restart switch. As the 1-1/2-volt (1/2 D size) batteries deteriorate, approximately 2 years, they are less capable of restarting the alternator. Any time alternators cannot be restarted under full load, the batteries should be replaced.

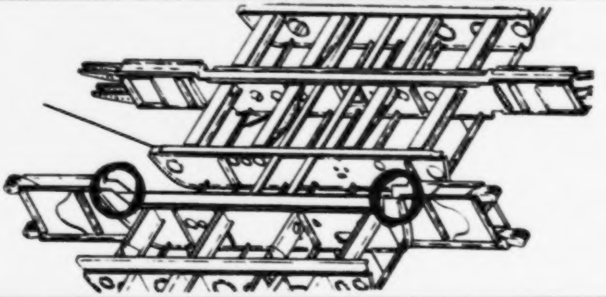
## CAUTION

Upon completion of the preceding test, turn on the battery portion of the master switch so the battery can stabilize the system. Operating the electrical system without benefit of battery stabilization is not recommended.

Cessna Service Manual P/N's D2506-6-13 and D2500-13 contain information pertaining to the emergency alternator system on other Cessna 337 aircraft.

---

NOTICE TO READERS: The General Aviation Airworthiness Alerts are, for the most part, prepared from information supplied by those who operate and maintain aircraft. The FAA encourages the reporting of all malfunctions or defects that come to the attention of service or operating personnel, even though the problem has been previously reported. FAA Form 8010-4, Malfunction or Defect Report, which supersedes FAA Form 8330-2, Malfunction or Defect Report, is available from the local General Aviation District Office, and may be used for reporting purposes.

| | | |
|---|---|---|
| Cessna<br>Model 402 Series | Cargo Door | The Cessna Model 402 series cargo door section has alerted in the Service Difficulty Automatic Data Alerting System. There are 11 reports in the data bank for the 2-year period from May 1, 1980, through May 1, 1982. There is an upward trend indicated, as nine of these reports were processed during an 8-month period beginning July 29, 1981, and ending March 29, 1982. Seventy-three percent of the reports were on Cessna Model 402C.<br>The nose baggage door accounted for 10 of the 11 reports. In 9 of those 10 reports, the door inadvertently opened in flight. The nose baggage door latch/handle assembly was the component cited as defective in each of the 10 reports. |
| Cessna<br>Model 402B | Cracked Plate | Two 1/2-inch cracks were found in the left and right wing stub plate attached to the main spar. All cracks terminated at the first rivet hole. Aircraft time – 3,330 hours.<br> |
| Cessna<br>Model 404 | Rudder Balance Weight Bracket | A 4-inch crack was found in the rudder balance weight bracket. The crack ran parallel to the mounted plate nuts that secure the balance weight. Aircraft time – 4,770 hours. |
| Cessna<br>Model 421C | Trim Indicator | The elevator trim indicator arm comes out of the control wheel sprocket. Incorrect trim indication has caused heavy nose down conditions during takeoff. The submitting operator advised of the same problem on C-310 and C-340 aircraft. |
| Cessna<br>Model 425 | Melted Sight Tube | The nose landing gear did not completely retract after takeoff. The gear was left in that position until time for landing. The hydraulic pumps were loaded during the flight which caused the hydraulic fluid to overheat. The hot fluid caused the sight gauge to melt and split depleting most of the hydraulic fluid. The nose gear extended and locked down for landing. No descrepancies were found in the gear system when the gear was cycled with the aircraft on jacks. |

IN ORDER TO ENSURE CONTINUED RECEIPT OF THE "ALERTS," AN ADDRESS CHANGE MUST BE REPORTED TO THE FAA DISTRICT OFFICE UNDER WHICH YOU EXERCISE YOUR CERTIFICATE.

## EMBRAER

| | | |
|---|---|---|
| Embraer<br>Model 110P1 | Cracked Plate | The reinforcement plate, P/N 4A3150-18-02, was found cracked at the angle that ties in the fasteners for the outboard side of the elevator hinge support bracket. Three bolts tying the hinge support flange to the aft spar were found loose. A 1-inch by 3.5-inch section of skin was broken out on top of the left horizontal stabilizer at the outboard elevator hinge support bracket. Submitter advised the crack or failure appeared to have started inside the stabilizer and worked to the outside. Aircraft time – 5,101 hours. |

## GATES LEARJET

| | | |
|---|---|---|
| Gates Learjet<br>Model 24D | Wing Flap Corrosion | Extensive corrosion was found under the flap leading edge extension. The leading edge extension was installed in 1977 during modification in accordance with STC-SA232-NW. The foam filler material apparently absorbs and traps moisture causing the corrosion. This corrosion condition was found on other modified aircraft. |

## MEYERS

| | | |
|---|---|---|
| Meyers<br>Model 200C | Mixture Control<br>Shaft Seal | During leaning attempt after climb, fuel started streaming down the control knob shaft onto the cockpit floor. The engine was leaned to approximately 50 percent power, and the fuel stopped streaming. An investigation revealed fuel flowed out around the shaft seal on the mixture end of the control valve when in full rich with the electric fuel pump on. Submitter recommends during inspection to exercise the mixture control with the electric fuel pump on, and check for fuel leaks around the shaft. |

## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-18-150 | Sight Gauge<br>Seals P/N 85012-51 | Leaking of several fuel sight gauges has been caused by the seals on the ends of the sight tube. Submitter advised the new seals are of rubber or neoprene composition which rapidly deteriorate when in contact with fuel. The previous seals were made of cork. |
| Piper<br>Model PA-28RT-201 | Cut Wires | The manual electric trim wire harness was found cut where the wires exit the end of the left yoke column. One wire was found severed and other wires with cut insulation. Full back pressure on the yoke pulls the harness against the yoke column bushing on the instrument panel. Time on aircraft – 86 hours. |

| | | |
|---|---|---|
| Piper<br>Model PA-31P | Downlock Hook<br>P/N 41983-00 | The left landing gear did not retract after takeoff. An investigation revealed the rivets in the downlock hook attaching bracket had sheared. The gear did not unlock during the retraction attempt which caused the main gear side brace to break. The gear was repaired, and retraction was normal. Submitter suggests that the downlock hook bracket rivets be checked with the aircraft on jacks and the side brace broken over center. Aircraft time - 2,997 hours. |
| Piper<br>Model PA-31T | Elevator Bearing<br>P/N 49265-02 | Excessive play was found when the elevator was moved by hand. The lower spherical bearing in the elevator bell-crank was worn almost through the outer race, and the torque tube aft rod end bearing was loose in the race. This was the third aircraft recently found in this condition by the reporting repair station.<br>NOTE: Related article and picture in Alert No. 44, March 1982. |
| Piper<br>Model PA-31T | Flap Switch | The flaps would not retract from the fully extended position to the 15° approach position. The only way to obtain the approach setting was to select flaps retracted, wait until flaps were full-up, then select approach setting. Replacement of the defective flap selector switch solved the problem. Aircraft time - 1,037 hours. |
| Piper<br>Model PA-32R | Loose Fitting | An investigation of an excessive pitot static system leak revealed a loose "tee" fitting. The location was inside the left trim panel where the static line enters from the left wing. Aircraft time - 200 hours. The same condition was found on a low time PA-28RT-201T aircraft. |
| Piper<br>Model PA-32-300 | Fuel Tank<br>Drain Valve | The inside portion of the CCA-1550 drain valve came out, and fuel drained freely through the hole. An inspection revealed there was not a flange on the inside stem. The O- ring broke, and the stem fell out. Further investigation disclosed the same part number valves were different in construction. Some valves had a flange on the stem, which would prevent the stem from falling out of the valve if the O-ring fails, while others did not have the flange. |
| Piper<br>Model PA-32R-301 | Actuator Bolt<br>P/N AN3-11 | The operator found the nose gear actuator aft mount bolt bent and notched upon delivery inspection of the new aircraft. The aircraft had three landings during the delivery flight. There have been other recent reports of failure of the AN bolt. |
| Piper<br>Model PA-36-285 | Vertical Fin Spar | Two aircraft were found with cracks at the upper rudder mounting bracket. The cracks originated at the lower rivet holes. The cracks were believed to be caused from failure to install rudder gust locks. |

PATIENCE IS SOMETHING YOU ADMIRE IN THE AIRCRAFT PILOT TAXIING BEHIND YOU -
BUT CAN'T TOLERATE IN THE AIRCRAFT PILOT IN FRONT OF YOU

| | | |
|---|---|---|
| Piper<br>Model 602P | Turbocharger Hose<br>P/N 920024-683 | All turbocharger oil pressure hoses had to be replaced within 300 hours after installation. The hoses were found hardened, cracking, loose at the fittings, and leaking oil. The oil was leaking directly onto the exhaust system. |

## SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA226 | Chafed Cable | The right rudder cable was found chafing the autopilot servo pulley guard under the floor at the entry door area. |
| Swearingen<br>Model SA226-TC | Missing Bolt | Upon arrival at destination, the flightcrew lowered the landing gear using the normal system. The right main gear did not come down. Using the emergency extension system also failed to extend the right gear. After many attempts, the right gear was lowered as follows: The crew retracted the gear. Then, with the handle in the UP position, the crew actuated the emergency extension system, and the right gear came down along with the nose and left gears.<br>An inspection revealed the center hinge bolt was missing from the right door of the right gear. With the center hinge bolt missing, the door sagged inward preventing the uplock hook from releasing the gear. This also prevented the emergency system from actuating with DOWN hydraulic system pressure on the gear.<br>The center hinge bolts were found loose on two of four other aircraft inspected.<br>Submitter advised there is no positive method of securing these bolts. |
| Swearingen<br>Model SA227-AC | Burned Tube<br>P/N 84187-019 | The flightcrew reported a battery fault indication during flight. An investigation disclosed the battery wire, P/N 189038-4, had chafed through the insulation and made contact with the bleed air tube. Severe arcing burned a hole in the bleed air tube. Aircraft time - 771 hours. |

# ACCESSORIES

## EDO-AIRE

| | | |
|---|---|---|
| Edo-Aire<br>Vacuum Pump<br>Model 1U128 | Sheared Shaft | Reports continue to be received of sheared shafts on low-time vacuum pumps. Six recent reports advised of shaft shearing during flight. There was no obvious cause for shaft shearing. Another report stated the pump vanes broke which caused the shaft to shear. The pump appeared clean and free of oil. No obvious reason for vane breakage. |

# ENGINES

## CONTINENTAL

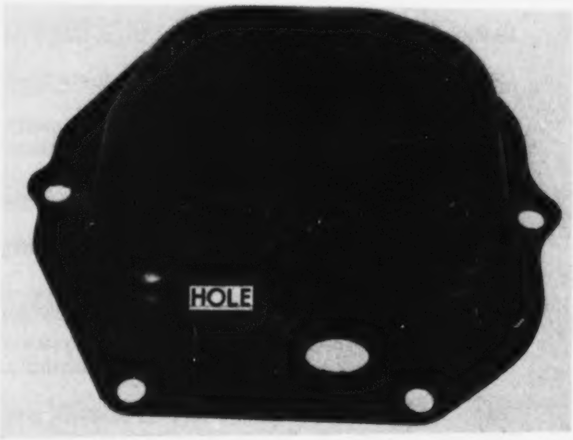
| | | |
|---|---|---|
| Continental<br>Model TSIO–520L | Cracked Cylinder | During an annual inspection, fuel stains were observed around No. 5 cylinder on both engines on a Beech 58TC. Cleaning and dye–penetrant inspection revealed the cylinders were cracked from the spark plug insert around to the injector hole. Submitter advised that if fuel stains are found, don't just assume the injector O–rings are leaking. Also, when leak–checking the fuel system, there was no leakage when the cylinders were cold, but when the cylinders were warm, leakage was evident. Total engine time – 852 hours. There was a similar report on engines on a Cessna 402C with 410 hours. |
| Continental<br>Model TSIO–520 | Cracked Crankcase<br>P/N 642096 | During routine maintenance, the left crankcase halves were found cracked on both engines on a Beech 58TC. The cracks were from the crankcase bolt hole down to the top aft cylinder stud and nut of number 4 cylinder. The crack was 4 inches on the left engine and 7 inches on the right engine. The engines were inspected at 853 hours, and no cracks were noted. Sixteen hours later, both engine cases were found cracked. |

## LYCOMING

| | |
|---|---|
| Lycoming<br>Model All Engines<br>Employing Parallel<br>Valve Cylinders | Cylinder Rocker<br>Box Cover |

Reports have been received of oil leakage caused by rocker shafts wearing holes through cylinder rocker box covers. Avco Lycoming Service Instruction No. 1176, dated October 27, 1967, advised that any nicks, roughness, or other damage on the ends of valve rocker shafts would cause rapid wear–through of the rocker box cover. Service Bulletin No. 400, issued June 4, 1976, calls for the installation of teflon thrust buttons in the ends of valve rocker arm shafts which should eliminate the wear problem.

The above article was published in the 1977 General Aviation Inspection Aids. A recent report advised of finding all the rocker box covers on a Lycoming 0–320–E2D worn 75 percent through by the rocker shafts. There may be other engines in service in the same condition. Time of compliance of Service Bulletin No. 400 is at next engine overhaul, but apparently some engines may need compliance prior to overhaul.



# MAINTENANCE NOTES

## ENGINE CONTROL SYSTEMS

There are 484 records in the service difficulty data bank of powerplant control system discrepancies which were reported in the past 2 years. The reports are on aircraft under 12,500 pounds. Several of the reports indicate that inadequate or improper maintenance and operational practices are contributing to the problem. Many of these discrepancies were found during routine inspections; others were undetected until the failure occurred in flight. This, in some cases, led to other complications that terminated in a serious or costly incident.

Listed below are examples of the major unsatisfactory conditions being reported. It should be noted that all of the problems arising are not limited to these alone. Further, these conditions are reported to develop on many makes and models of aircraft.

1. Flex housings and internal wire or cable failures because of a lack of lubrication, improper routing, sharp bends, inadequate support, misalignment at the unit being controlled, and the use of hardware that was not at least equivalent to the original.

2. Push-pull controls worn as a result of inadequate rod end lubrication, chafing, misalignment, and improper security at the attach points.

3. Bellcrank failures developed because of improper rigging, misalignment, inadequate lubrication, incorrect security of attachment, and the use of the wrong type of hardware..

4. Improper use of the vernier control– causing damage to the internal throttle cable and eventual cable separation and loss of power control.

Certain engine control problems appear to be more prevalent on certain aircraft such as:

Beech 58 – Propeller governor control rod end worn – separated from socket.

Beech 200 – Propeller/throttle controls freeze at altitude.

Cessna 152 – Mixture control breaks inside the shield.

Cessna TR182 – Throttle binds; bushings develop flat spots.

Cessna 188 – New cables coming loose at swaged end.

Cessna 210 – Throttle control cable breaks just forward of throttle control.

Cessna 340 – Throttle cable seized, frozen. Cable passes close to turbo exhaust.

Cessna 441 – Propeller pitch control and fuel control rod ends worn.

Embraer 110P1 – Propeller governor beta switch worn and out of adjustment. Autofeather system inoperative–pressure switch stuck open – closed – failed.

Piper PA-31 – Propeller control rod end separates at governor. Throttle cables breaking.

Piper PA-34 – Throttle cable freezes during cold weather – breaks.

Piper 601P – Propeller control cable housing melting where control passes near turbocharger.

Swearingen SA-226TC – Propeller governor system beta switch inoperative. Power lever cable rod end ball worn. Power lever control cables breaking.

Many of the problems require time to develop, and during this period, these systems need frequent and thorough inspection. Safe and reliable operation depends upon early detection and prompt corrective action. If there are any questions regarding the maintenance of these systems, it is suggested that the pertinent manufacturer's service data be followed.

The number of reports indicates that this is an area for improved maintenance practices and inspection techniques.

## VOLCANIC ASH

1. Introduction. On May 21, 1980, a special General Aviation Airworthiness Alert was issued entitled "Volcanic Ash Hazard." Alert No. 26, September 1980, contained an article entitled "Volcanic Ash – More Information." The purpose was to provide safety information and recommended actions to preclude possible airworthiness problems associated with aircraft exposure to volcanic ash either in the atmosphere or on the ground. The following contains excerpts from the previous special alert and from Alert No. 26. The information is being disseminated because of the possibility of additional volcanic emissions.

2. Background. Volcanic ash from Mount St. Helens has been analyzed to contain abrasive and corrosive materials such as sulfuric acid and floride and chloride salts and acids. Depending on the location of the volcanic ash fallout, the particle sizes range from as small as .5 microns to 100 microns. Most aircraft screens will filter out material down to 15 microns but will pass particles that are smaller.

The ash was encountered as a fine powder, light gray in color. Field reports have indicated that when the bulk ash becomes saturated with water, removal becomes difficult due to its tendency to harden. Although volcanic ash may not be visible on the structure, sulfuric acid may still exist causing corrosion, and it is recommended that all aircraft that have been exposed to volcanic fallout be given a test to determine the acidity levels. This can be accomplished by the application of nitrazine paper available from many pharmacies. In addition to the more readily accessible nitrazine paper, other wide range pH indicators may also be used. Specifically, hydrion paper (available from many high school or university laboratories or, in some cases, laboratory supply companies) gives a direct and unambiguous test for pH. If the pH factor is 4 or below, it is recommended that the following corrective actions be taken as soon as practicable.

3. Airframe.

a. Safety precautions should be taken, such as wearing safety glasses, gloves, and protective clothing.

b. Aircraft should be cleaned in the following sequence:

(1) The aircraft manufacturer's maintenance manuals should be followed regarding the protection of aircraft systems during the cleaning process. The procedures recommended by the manufacturer for the inspection and cleaning or purging of pitot static systems, instruments systems, etc., should be followed.

(2) If there is a coating of volcanic ash on a surface, great care should be taken in its removal to avoid increased abrasive action by applying pressure to the ash coated surface, such as walking or dry scrubbing. Initial removal by air or vacuum cleaning is followed by washing in the recommended procedure.

(3) The aircraft should be thoroughly cleaned, inside and out, before washing.

(4) The aircraft should be rinsed thoroughly with fresh water, without scrubbing, to ensure that all parts of the aircraft have been amply rinsed.

(5) The aircraft should be given a test at the completion of each wash cycle to ensure a pH factor of above 4. The pH factor may be performed by taping nitrazine paper strips on various parts of the structure and wetting with distilled water.

(6) It may be necessary to repeat the wash procedures on a continuous basis in areas where fallout continues. To ensure that the sulfuric acid is neutralized, complete the wash cycle using a petroleum base solvent.

(7) It is recommended that, regardless of the pH factor, aircraft exposed to volcanic ash be given a water wash as assurance against corrosion.

(8) Close inspection for external signs of damaged seals should be performed, especially landing gear and landing gear actuators.

4. Systems. For all aircraft exposed to volcanic ash on the ground or in the air, system checks should include inspection of pitot-static probes, static ports, air conditioning outflow valves and filters, generator cooling tubes and filters, vacuum lines and filters, and externally mounted sensors, such as long wire antenna and angle-of-attack sensors, to remove any ash contamination. Precautionary inspection of electronic equipment subject to cooling air should be done on a random basis to assure need for equipment removal for removal of ash contamination.

5. Powerplant Considerations.

a. General. As noted above, the nature of the volcanic ash is that it is both abrasive (in the form of fine powder) and corrosive (in the form of acid content). Both turbine engines and reciprocating engines may be affected. Compressor and turbine blades suffer erosion by abrasive particle impact. Furthermore, at temperatures characteristic of the primary combustion region of jet and reciprocating engines, such material can melt, forming a glossy coating over exposed parts. Rapid engine deterioration may result when flying in or through a volcano-produced ash cloud. Lubrication and other fluid systems are subject to contamination by solids and chemicals, while moving parts are subject to abrasive wear.

The abrasive nature of the material causes rapid mechanical damage to moving parts. Experience has shown that engines operated with oil contaminated with the ash has caused them to fail in as few as 20 hours after exposure.

The acids associated with the ash are soluble in oils and as such attack engine parts resulting in rapid deterioration. Engines can also be attacked externally by the corrosive action.

b. Maintenance. Engines which have been operated or subjected to a volcanic ash fallout need:

(1) Thorough external cleaning.

(2) Cleaning or changing of all oil, fuel, and other systems' screens and/or filters and draining all sumps. Flushing and cleaning of contaminated fluid systems should be accomplished following the engine manufacturer's recommended procedures.

(3) Cleaning and scavenging of any open tanks where the ash or chemical action could collect and concentrate.

(4) Oil and fluid draining and change.

(5) Close inspection for external signs of damaged seals.

(6) Cleaning and inspection of accessories and components for contamination such as vacuum filters and regulators.

(7) Following cleaning, inspection, and fluid changes, the proper operation of the engine should be verified by run-up. Frequent oil and fluid changes should be scheduled. During subsequent operation, temperatures and pressures should be monitored closely for changes which may signal problems.

(8) Spectrographic oil analysis is an indicator of engine wear and contamination. Comparison of analysis of early samples after cleaning with previous analysis reports can serve as an indicator of an engine's stability.

6. Recurrent Inspections. Aircraft owners and operators are urged to closely monitor aircraft and engines, including systems, on a continuing basis and take action as deemed necessary for aircraft exposed to volcanic ash as assurance against corrosion.

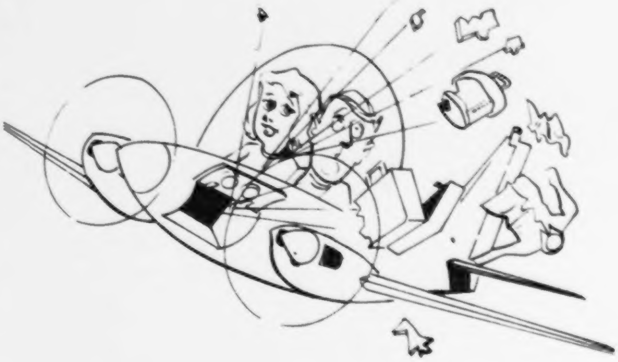
NOTE: Advisories have been issued by several major airframe and engine manufacturers. These advisories pertain to operation and maintenance of the aircraft and engines relative to exposure to volcanic material and may contain more detailed information relative to specific applications.

## NOSE CARGO DOORS

Instances of in-flight opening of nose cargo doors continue to be reported. These occurrences are attributed to improper latch adjustments and/or failure to secure the door properly. The in-flight opening of nose cargo doors is not confined to any one model, but may be a general problem on all light twin-engine aircraft. The necessity for proper locking of nose cargo doors cannot be overemphasized.

It is recommended that owners/operators of aircraft having nose cargo doors reevaluate their maintenance procedures to include the inspection, cleaning, lubrication, and proper adjustment of the locking mechanism and indicating/warning systems. Air taxi operators should also emphasize to their servicing and ground handling personnel that proper closing/locking of the nose cargo doors is a very critical part of the continued safe operation of their aircraft.

NOTE: See article on page 5, reference Cessna 402 cargo doors.



# CAUTION

## BE AWARE

An aircraft, powered by two Lycoming IO-720-B1B engines, landed gear-up after an engine failure about 20 minutes after takeoff. The investigation revealed that two pistons in the left engine had melted because of severe detonation caused by an extremely lean fuel-air mixture in the cylinders. It was determined that the lean mixture resulted from the installation of two improper fuel injector lines. These lines were, in fact, primer fuel lines which appear nearly identical to the proper fuel injector lines. However, their inside diameter is much smaller than the proper injector lines.

The engine had been overhauled approximately 143 hours previous to the accident. There were no records to indicate the lines had been replaced since overhaul.

According to Avco Lycoming Service Instruction No. 1301, entitled "Identification of Primer and Fuel Injector Lines," there are three distinct fuel lines in use on Lycoming engines. One line, P/N 61581, is used as a primer line on all engine models and as P/N 61581-A on one engine model as an injector line. These lines are identified at the factory by a red paint mark. Another line, P/N 73842, is used as an injector line for one particular engine model only and is identified by a white paint mark. The third line, P/N LW-12098, is used as an injector line on all other Lycoming engine models and has no identifying marks. The lines on the engine involved in this accident had no identifying marks, but measurements of the inside diameters revealed that they were primer lines.

There is concern that these lines will continue to be misidentified, as none of the fuel lines have permanently affixed identification. The part number is lost when the manufacturer's tag is removed, and the paint stripe may be worn off in service. The following excerpt is from Avco Lycoming Service Instruction No. 1301, dated May 3, 1974:

> "The various fuel lines used on Avco Lycoming engines are quite similar in appearance and, in some instances, can be distinguished only by actual measurement. Care must be exercised by the repair agency whenever repairing or replacing fuel lines since engine operation can be affected if improper lines are used."

The service instruction contains the tubing inside diameter and the number of twist drill that can be used to check the inside diameter of the lines having different part numbers.

The importance of compliance with Avco Lycoming Service Instruction No. 1301, dated May 3, 1974, whenever Avco Lycoming primer and/or fuel injector lines are replaced, cannot be overemphasized.

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# General Aviation Airworthiness Alerts

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**AC No. 43-16**

**Alert No. 51**
**October 1982**

## Improve Reliability-Interchange Service Experience

TD 4.414:

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

ADVISORY CIRCULAR
AC 43-16

# GENERAL AVIATION AIRWORTHINESS ALERTS

OCTOBER 1982

FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

## AIRCRAFT

### AEROSPATIALE

| | | |
|---|---|---|
| Aerospatiale Model SA-315B | Horizontal Stabilizer | The horizontal stabilizer spar cracked and broke just outboard the attach point of the left side tubular spar. The stabilizer went over the tail boom and broke one tail rotor blade. The attach points for the tail rotor gear box and the hangers for the tail rotor drive were also broken. The helicopters are used in external load operations. The operator has experienced two previous failures of the horizontal stabilizers. The operator is now conducting 50-hour inspections and plans to replace the part at 2,400 hours. Aircraft time at last failure - approximately 5,000 hours. |
| Aerospatiale Model SA-319B | Water in Switch | The operator was having engine start problems. During the investigation, the microswitch box on the fuel governor was found water saturated. The switch was corroded and would not reset. Submitter advises the microswitch box cover is not sealed, and sealing may prevent water entry. Aircraft time - 1,516 hours. |

## BEECH

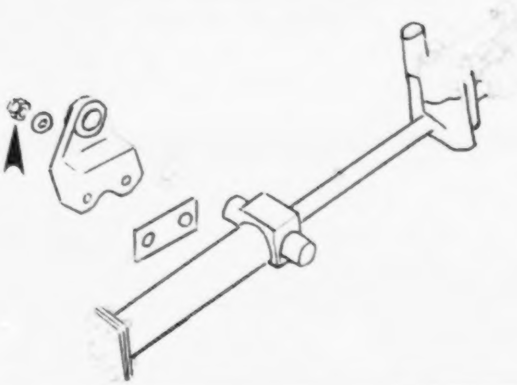
| | | |
|---|---|---|
| Beech<br>Model D55 | Rusted Bearings | The aileron would bind when fully deflected both right and left. An investigation disclosed the bearings in the control column were rusted and frozen. Aircraft time – 2,017 hours. |
| Beech<br>Model 95–B55 | Broken Clamp | The left engine alternator capacitor was observed missing during an annual inspection. The capacitor was found in the bottom of the engine cowling. The clamp that holds the capacitor in place on the alternator had broken. Submitter advises this is the third clamp found broken and recommends the clamp be inspected each 50 hours. |
| Beech<br>Model C99 | Horizontal Situation<br>Indicator | There have been four recent reports of the pilot's HSI deviating 10° to 15° when the left landing light is turned on. The flux valve for the compass system is mounted above and behind the landing light. |

## BELL

Bell
Model 206B

Trunnion Plate
Bolt and Nut

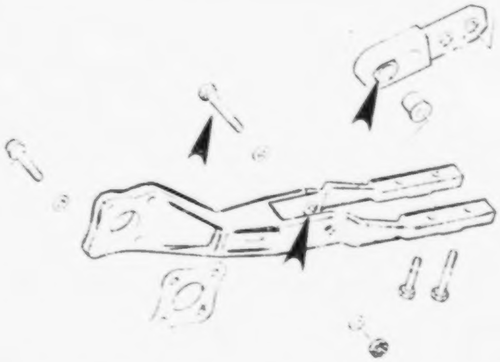
The nut lost torque which allowed the bolt to loosen. The trunnion plate could be shifted fore and aft to the point that cyclic feedback was experienced. The nuts on the other servo trunnion plate were found torqued to 40 to 50 inch–pounds. Submitter advised the Bell 206B maintenance and overhaul manuals do not specify a torque for these nuts.



Bell
Model 222

Seized Bearing
P/N ATL6

The aircraft returned to base with reported lateral vibration. An investigation revealed the bearing had seized and had scored the P/N 222-031-642-101, cam assembly. Aircraft time – 542 hours. The Bell VNE kit had been installed 120 hours prior to the bearing failure. The above parts are part of the flexure restraint installation for the main rotor transmission.



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## CESSNA

Cessna
Model 150

Horizontal Stabilizer

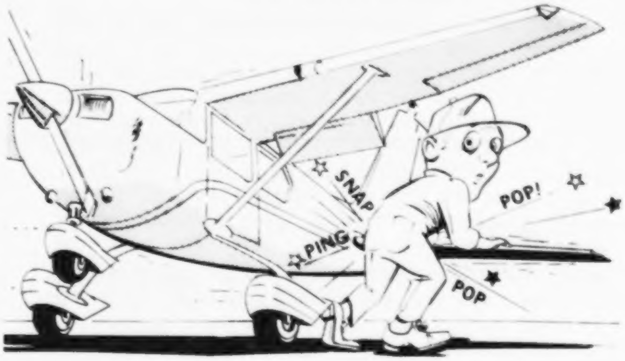
Service experience and engineering tests indicate cracks in the forward attachment stiffener can be caused by excessive loads being imposed on the horizontal stabilizer if improper procedures are used during ground handling. It is important that pushing forces be applied close to the fuselage when moving an aircraft by the horizontal stabilizer (reference Model 150 Service Manual, Section 2, Ground Handling).

Cessna has issued Service Letter No. SE71–32 which supersedes Service Letter No. SE68–32. The current service information provides additional modification instructions and information relative to a modification kit designed to reinforce the present stiffener or replace the stiffener and bulkhead assemblies with improved parts.

Field inspections of a few high–time Model 150's incorporating the earlier design stiffeners have disclosed some minor skin cracking. As a result, Service Kit Nos. SK150– 43 and SKI50–44 have been developed to provide a field repair. These kits and the areas involved are described in Cessna Service Letter No. SE73–23.

This article was published in Alert No. 31, dated February 1981. The stiffener assembly was recently found to be cracked at the forward and aft flanges on a Cessna 150H. The damage was believed to have been caused by pushing on the stabilizer to move the aircraft.

Horizontal Stabilizer
Attach Stiffeners



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Cessna
Model 172N

Fuel Lines Split

After a period of very cold weather, the aircraft owner found fuel leaking into the left side of the cabin. An investigation revealed the upper and lower fuel lines in the doorpost were split and leaking fuel. The probable cause was water freezing in the fuel lines. Submitter recommends all sumps, including the selector valve, be drained often and thoroughly.

---

Cessna
Model 172P

Loose Cables

A report was received which advises the marker beacon and transponder antenna cables, taped to the fuselage bottom skin at station 124.00, come loose and flop on the control cables. Submitter advises the marker beacon and transponder antenna cables should be rerouted and secured with nylon cable strap or clamps to prevent the problem.

---

Cessna
Model R182

Battery Box
P/N 1550247–1

The battery box cracked and allowed battery acid to corrode the lower firewall, engine mount, fuselage, and the battery box base assembly. Submitter suggests inspecting the battery box assembly for cracks. Aircraft time – 695 hours.

Cessna
Model 188 Series

Aileron Cable
Pulley Inspection

Cessna Service Information Letter No. SE82-19, dated May 7, 1982, recommends a one-time inspection of the aileron cable pulleys installed in the wing gap area of Model 188 series airplanes built in calendar year 1979. The purpose of this inspection is to assure that the proper pulley is installed.

The correct pulley is P/N 1660433-2 and not P/N S378- 2. The part numbers should be marked on the pulleys.

This problem is similar to that described on page 5 of Alert No. 35, dated June 1981, which was based on Cessna Service Information Letter No. SE81-2.

Airplane Serial Numbers affected:

18803297 through 18803521
18803297T through 18803521T
T18803307T through T18803521T

---

Cessna
Model 180
and 185 Series

Flap Track
P/N 1221010-XX

Reports have been received of flap tracks being cracked at the attachment angles. One broken flap track was discovered during a pre-flight inspection because the left-hand flap could be moved 3 inches when it was fully extended.

Submitter recommends the flap tracks be checked at each scheduled inspection or whenever the flaps show abnormal movement.

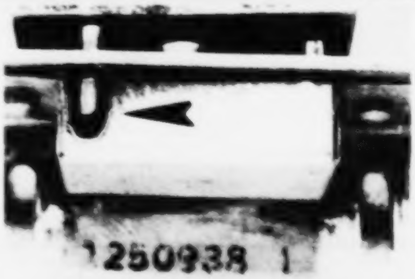
---

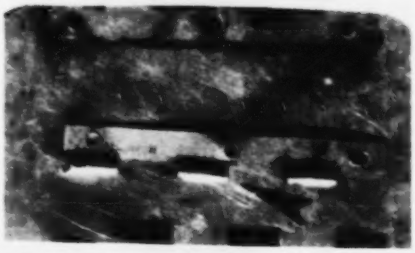
Cessna
Models TP206,
TU206, T207, and
T210 Series

Alternate Air Door
Hinges and Magnetic
Catches

We continue to receive reports of engine turbochargers requiring repair or replacement because of foreign object damage due to failure of alternate air door aluminum hinges or air intake door magnetic catches. Cessna recommends the alternate air door hinge and magnetic catch assemblies be inspected at 100-hour intervals. If the hinge shows signs of wear, it should be replaced with a stainless steel hinge, P/N 1250839-20. The magnetic catch should also be replaced when excessive wear is evident. Cessna Service Information Letter No. SE80-12 gives details on the stainless steel hinges.

NOTE: This article was published in Alert No. 38, dated September 1981. A recent report advised of turbocharger replacement because of alternate air door hinge ingestion.





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Cessna
Model P210

Battery Box

During a 100-hour inspection, a hole was found corroded through the aft wall of the battery box into the pressure capsule. Part time – 337 hours.

| | | |
|---|---|---|
| Cessna<br>Model 404 | Induction Air Box<br>P/N 5854101-37 | During a 100-hour inspection, the left engine turbo inlet blades were found badly damaged. Further inspection revealed the air box was cracked, and a piece had broken out and had gone through the turbocharger. The right engine air box had loose rivets and parts of the rivet heads missing. Submitter advises it appears the heads of the countersunk rivets, used to attach the valve body assembly to the forward wall of the box assembly, are cracking and breaking off. After the rivet heads break away, the sheet metal wall of the air box vibrates, fatigues, and cracks through the rivet holes. Time on the broken induction air box was 497 hours. |
| Cessna<br>Model 414A | Clamp<br>P/N MSP9963 | The course indicator tilted down inside the instrument panel when the pilot turned the set knob. The elevator controls could not be moved beyond neutral for landing. The landing was accomplished without further incident. An investigation disclosed that the instrument clamp holding the course indicator to the panel had one of four rivets missing and another ready to pull through the clamp. Loss of any rivet destroys 50 percent of the clamp's retention effectiveness. This report was received in August 1980. Since then, reports continue to come in regarding the clamps which mount such items as the NAV indicator, DME, or autopilot mode selector. The rivets are found to be popping out which allows the instrument to become loose in its mount. In some instances, it would be possible for the instrument to drop down and jam the controls. So far, the reports have pertained to the 200 and 400 series Cessna aircraft. The reported problem clamps had either MSP9963 or MSP64311 on the clamp. One report advised of finding five clamps with sheared or missing rivets.<br>NOTE: This article was published in Alert No. 36, dated July 1981. See the following article received June 21, 1982. |
| Cessna<br>Model 414 | Mode Selector Clamp<br>P/N MSP64311 | The aircraft was on downwind with gear and flaps extended. The autopilot mode selector clamp rivets failed, allowing the instrument to fall. The elevator up-travel was restricted at approximately neutral. The aircraft contacted the runway nosewheel first at a 200 – 300 feet per minute rate of descent. Submitter recommends installing a strap retainer as described in Cessna Service Letters AV79-17 and AV81-13.<br>NOTE: There are nine Service Difficulty Reports of failed rivets or broken P/N MSP64311 clamps, two reports on P/N 41038 clamps, and one report on P/N MSP9963 clamps for the previous 2 years. |
| Cessna<br>Model 421C | Drain Valve<br>P/N 50BSH9C | There have been three recent reports of bent or broken fuel crossfeed drain valves. Submitter advises the valves had been hit with a brush or a hand during aircraft washing. Submitter recommends that all owners, operators, and maintenance personnel be made aware the valves will easily break from side pressure or if hit by a hand or a brush. |

## CONSOLIDATED AERONAUTICS

| | | |
|---|---|---|
| Consolidated Aeronautics Model LA-4-400 | Propeller Damage | Recent reports advised of propeller damage from exhaust flange nuts vibrating off and going through the cowling. Another report stated a hose clamp of unknown origin came through the cowling and damaged the propeller and right wing. Submitter recommends a lock device on the exhaust flange nuts and possibly a screen on the cowling to help prevent propeller damage from loose hardware. |

## DEHAVILLAND

| | | |
|---|---|---|
| deHavilland Model DHC-6 | Main Landing Gear Link | During replacement of the right main gear leg, maintenance personnel found the support link, P/N C6UM1123-27, cracked vertically from the jacking point for about 2-1/2 inches. The area can be seen without any disassembly of the gear unit. Time on aircraft - 26,141 hours. |
| deHavilland Model DHC-7-102 | | Both communication radios were barely readable. The outside air temperature was -5° C with moderate snow. The crew reported that reception was normal in clear weather and in light precipitation. An investigation revealed one bent static wick and corrosion under the static wick mounts. The bent static wick was replaced, the corrosion cleaned up, and the aircraft returned to service with no further problems. |

## EMBRAER

| | | |
|---|---|---|
| Embraer Model 110P1 | Doorstep Stop-plate P/N 110P2-1243-10-36 | Two recent reports advised of finding the front entrance doorstep stop-plate cracked. The cracked plate allowed the step to bend down on the right side. |

## GATES LEARJET

| | | |
|---|---|---|
| Gates Learjet Model 35A | Actuator Hose P/N 2307006-131 | All hydraulic fluid was lost during flight. An emergency landing was accomplished without further incident. An investigation disclosed the "B" nut on the hose to the retract side of the landing gear actuator was loose. The location was where the hose attaches to the 45° fitting in the wheel well. Further investigation revealed the 45° bulkhead fitting had not been aligned with the actuator hose. Cycling of the landing gear eventually loosened the attaching "B" nut. The hose fitting was repositioned in its relationship to the actuator which relieved stress on the fitting and hose. Aircraft time - 500 hours. |

## HUGHES

Hughes
Model 269C

Broken Cable

The engine disengaged from the main rotor system during ground run-up. An investigation revealed the belt drive idler pulley tension cable had broken at the swaged ball end. Corrosion or damage which could have caused the failure was not evident. Aircraft time – 3,174 hours.

## ISRAEL AIRCRAFT

Israel
Model 1124A

Hydraulic Pump

Skydrol was observed under one engine during a pre-flight inspection. Further investigation revealed a casting flaw at the plug part of the upper hydraulic pump body. The flaw was a small hole approximately 1/16-inch in diameter. Aircraft time – 34 hours.

## PIPER

Piper
Model PA-18-150

Broken Tail
Wire Clevis

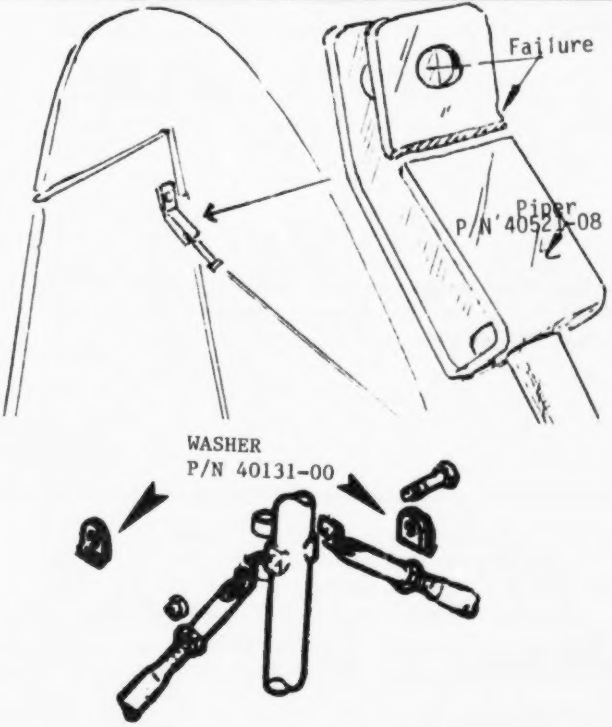
The tail wire bracket on the left side of the vertical stabilizer was found broken during a pre-flight inspection. The part appeared to have been broken for a period of time. Total aircraft time – 112 hours.

Another report advised the lower left tail brace wire clevis, P/N 40521-9, was found broken at the horizontal stabilizer. Aircraft time – 87 hours.

Airworthiness Directive 81-06-08 pertains to the lower fuselage brace wire attachment.

NOTE: This article was published in Alert No. 47, dated June 1982.

An owner of an aircraft rebuilding, maintenance, and overhaul service advised the sketch did not include a washer, P/N 40131-00, which should be installed on each clevis on the vertical fin. The washers are not required at the other tail brace wire attach points, just on the vertical fin. He frequently finds the washers missing during annual inspections. He further advised that moving the aircraft by the wires (they make excellent handholds when trying to get the aircraft out of the hangar by yourself) is a probable cause for failure of the tail wire clevis.



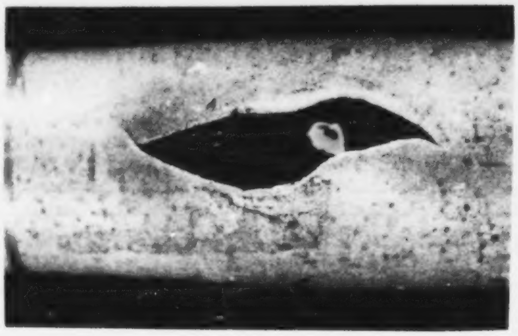
Piper
Model PA-22

Wing Flap Hinges

The inspection of a failed flap hinge and bracket showed all four were badly rusted and cracked. These hinges are not readily visible due to the wing fabric overlapping the area. In some cases, it may necessitate the trimming or cutting away of the fabric in order to inspect these hinges properly. Submitter suggests that on high-time aircraft or aircraft parked outdoors and exposed to the elements, a careful inspection of these hinges be made. Time on the aircraft – 2,000 hours.

Piper
Models PA-23-150,
-160, -235, -250,
and PA-E23-250

Fuel Cell
Vent/Drain Lines



Reports have been received which indicate that accumulations of water in the fuel cell vent lines had frozen, rupturing the line. This situation allows fuel to leak into the wing cavity.

Piper Aircraft Corporation has issued Service Bulletin No. 340 which pertains to this problem and provides an inspection procedure for the fuel cell vent/drain system. Piper recommends this inspection be accomplished after each 100 hours of operation.

This article was published in the 1972 General Aviation Inspection Aids. A report was received in March 1982 of an identical problem on a PA-23-250.

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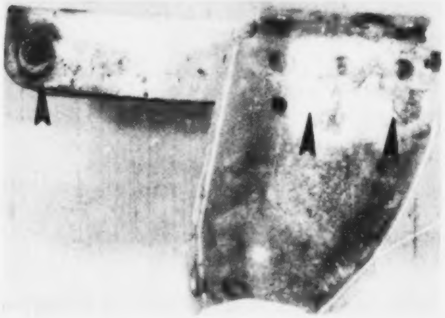
Piper
Model PA-28-151

Corroded Hinge
Bracket



The flap hinge brackets inside both flaps were found to have severe corrosion. Records indicate the aircraft was manufactured in 1974 and had accumulated 3,450 hours.

---

Piper
Model PA-28-181

Electrical Short

The ammeter gauge showed full scale deflection, and the alternator light remained on. An investigation disclosed a 1-inch long upholstery screw had been screwed into the alternator output cable. This caused a dead short through the screw which heated to the point of charring the upholstery. The screw was in the aft interior panel at the rear bulkhead panel, 8-3/4 inches above the baggage compartment floor. Submitter recommends the upholstery screws be relocated outside an area of 5 to 9- 1/2 inches above the baggage compartment floor, because this area contains the electrical wires that run into the tail section of the aircraft.

---

Piper
Model PA-30

Throttle Control
Ball Joint

The right engine lost power at 1,000 feet altitude after departure. The propeller was feathered, and the flight terminated without further incident. An inspection revealed the right engine throttle linkage at the fuel control had fallen off. The left engine was checked, and the linkage fell off when the mechanic checked it for security. It was determined that Piper Service Bulletin No. 515, dated January 17, 1977, had not been accomplished.

---

Piper
Model PA-30

Wing False Spar

When removing the ailerons from the aircraft for inspection, cracks were found in the outboard end of the wing false spars. Both wings were cracked at the strobe power supply attachment bolt holes. Time on the aircraft – 3,179 hours.

| | | |
|---|---|---|
| Piper<br>Model PA–38–112 | Wing Spar Attach Bolts<br>P/N AN6–14A | During a routine inspection of the aircraft, the mechanic found six wing attach bolts loose. The location of these bolts was in the forward spar–to–fuselage attach point. Time on the aircraft – 1,367 hours. |
| Piper<br>Model PA–44–180 | Battery Box | Battery acid leaked into the internal nose structure of the aircraft. Corrosion was found on the nose gear trunnion attach and through bolts. The nose gear down limit switch was defective from acid, and corrosion was under the heater and on the heater fuel lines. Further investigation revealed the battery box was cracked along the lower right side where the drain line is located. The drain line was loose and leaking. Probable cause for the cracked battery box was severe stress and vibration during hard landings. The aircraft is used for training and had accumulated 1,530 hours of training maneuvers. |
| Piper<br>Model PA–44–180 | Gear Trunnion<br>P/N 67926–08 | Ten recent reports advised of cracks below the rear web approximately 5 inches from the bottom of the trunnion. Aircraft times were from 883 to 2,420 hours.<br>NOTE: Related article and picture in Alert No. 48, dated July 1982. |
| Piper<br>Model PA–44–180 | Trim Cable<br>P/N 62701–161 | Six broken wires were found in the forward trim cable for the stabilator. This was the second trim cable replaced on the aircraft in 1,400 hours of operation. Another report advised of cable replacement at 584 hours aircraft time. |
| Piper<br>Model 601P | Torque Tube<br>P/N 600019–503 | The Cherrylock rivets that attach the torque tube to the universal joint, P/N MS20271B20, for the left elevator are being found loose. Submitter advises this condition and worn universal joints are being found on low-time aircraft. The manufacturer's elevator play tolerance is exceeded when the rivets become loose. Time on reported aircraft – 373 hours. |

## ROBINSON

| | | |
|---|---|---|
| Robinson<br>Model R22 | Flex Plate<br>P/N A193–3 | The aft flex plate to the tail rotor was found cracked during an inspection. The crack was approximately 3/4 inch below the bolt hole in one of the ears. The ear was cracked 75 percent across. |

## SIKORSKY

| | | |
|---|---|---|
| Sikorsky<br>Model S–76 | Relay Box Wire | It was reported the No. 1 landing gear relay overhead panel was wired with very stiff wire. The stiff wire and vibration were causing the relay pins to break. A variety of gear problems result from the broken pins such as – gear will not extend – gear falls out of the uplocks – gear in–transit lights remain on at all times, etc. Submitter suggests rewiring with multistrand soft wire with an excess loop of wire between the pins. |

### SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA226 | Plugged Drain | The elevator control column appeared to seize several times after the aircraft had been in heavy precipitation for an extended period of time. Bumping the control column returned the elevator operation to normal. The outside air temperature was 0° F. The stabilizer drain system was found plugged after landing. |
| Swearingen<br>Model SA226–TC | Broken Wire | The gear did not extend when selected down during approach for landing. The gear selector was left in the DOWN position during the go–around. The gear extended normal during the go–around. Maintenance personnel found a wire to the gear down switch in the cockpit pedestal broken and making intermittent contact. |

### VARGA

| | | |
|---|---|---|
| Varga (Morrisey)<br>Model 2150A | Voltage Regulator | The ammeter was very erratic. The voltage regulator cap was removed, and the regulator was found full of water and badly corroded. Submitter recommends the cap be sealed with a silicone rubber sealant. |

## INSTRUMENTS

### UNITED INSTRUMENT

| | | |
|---|---|---|
| United Instrument<br>Altimeter<br>Model 5934 P1,<br>5934 P1A, and<br>5934 A67 | Broken Spring<br>P/N 32C–3–6 | Three recent reports advised altimeters failed to meet the requirements of Federal Aviation Regulations Part 43, Appendix E. The intermediate wheel spring was found broken in each altimeter. Time on the altimeters was not given. |

## ACCESSORIES

### RAJAY

| | | |
|---|---|---|
| Rajay<br>Turbocharger<br>Model 325E10–1 | Housing Cracks | A report was received of cracks in the exhaust housing radiating from an interior casting flaw. The submitter advised of six cracked housings with aircraft service time varying from 40 to 400 hours. The turbochargers were on Continental TSIO–360–GB1 engines. |

### SLICK

| | | |
|---|---|---|
| Slick<br>Magneto<br>Model 662 | Impulse Spring | Impulse coupling springs have been found with the angle of the spring end bent in instead of out. The spring end will not stay in the impulse housing. One operator found four springs in his stock with the wrong angle on the spring end. |

# EQUIPMENT

## EMERGENCY LOCATOR TRANSMITTERS

ELT's and Batteries – Excerpts From Recent M or D reports.

| | |
|---|---|
| CIR-11-2 | Submitter advised recently of finding two CIR-11-2 ELT's in the OFF position. There was not an arrowhead on the switch, and the OFF detent was mistaken for the ARMED detent. |
| EBC-102A | The ELT triggered and transmitted for several hours before the parked aircraft was found and the unit turned off. Submitter advised this has occurred several times because of the light touch required to trigger this type ELT. |
| DM ELT 6 | The ELT actuated spontaneously. The unit was found to have an extremely sensitive "G" switch. ELT was sent to factory for repair. |
| DM ELT 6<br>Battery BP-1020 | During a 100-hour inspection in May 1982, the ELT output was found very weak and intermittent. The battery was replaced, and the ELT operation was normal. The weak battery was installed in October 1981, with a replacement date of October 1982. |
| DM ELT 6<br>Battery Pack ELT 6.11 | Battery pack was found badly corroded and leaking. Condition was found 1 year prior to stamped replacement date. |
| DM ELT 6 | Capacitor fell off of the printed circuit board. |
| DM ELT 6<br>Battery Pack<br>DM ELT 6.13 | The battery pack was found ruptured, and the ELT corroded during the first annual inspection on an aircraft with 49 hours total time. |
| Garrett Rescu/88<br>Battery P/N 136-903-9001 | The ELT would not function. The battery had leaked acid and corroded the ELT. |
| Garrett Rescu/88<br>ARTEX Battery<br>R-88 | Battery polarity reversed — red wire – negative, black wire – positive. This was the second battery the submitter received in this condition. The first battery was installed, and the ELT was damaged as a result. |
| Sharc 7<br>ARTEX Supply<br>Batteries P/N 00-04-006 | The ELT failed test during annual inspection in May 1982. The ELT batteries were found severely corroded. The battery replacement date was shown to be November 1982. The batteries were magnesium and were retrofits to comply with Airworthiness Directive 79-18-05. Submitter advised the individual batteries did not have date codes, and there did not appear to be a positive method to control shelf life. |
| ARTEX Batteries<br>P/N 00-04-006 | Set of six magnesium batteries overheated prior to installation in the aircraft. The batteries discharged internally with considerable heat factor. Batteries had TSO-C91. |

| | |
|---|---|
| Sharc 7<br>Battery ARTEX<br>Supply P/N 00-04-06 | Some batteries were removed and placed on a counter. Approximately 10 minutes later, the batteries started emitting smoke. Smoking stopped when batteries were thrown into water. |
| NARCO ELT-10 | Water destroyed the electronic portion of the ELT installed in a PA-44-180 aircraft. The unit lies on its back in a tray and is not sealed or protected. The aircraft was in a heavy rainstorm approximately 1 month previously. |
| NARCO ELT-10<br>Battery P/N 57674-0001 | During an annual inspection, the battery cell cover was found cracked, and a wax-like material was on the outside of the cover. The cover was removed, and the plastic outer shell of the sealed battery was found cracked. The cell appeared swollen, and there was a powdery and sticky wax-like material inside the case. Battery replacement date was December 1981. The above condition was found in April 1982. |
| NARCO ELT-10<br>Battery P/N 57674-0001 | The ELT was inoperative. The plastic sealant had split and electrolyte had leaked out of the unit. Careful removal of the cell pack revealed erratic voltage with some showing reverse polarity. Submitter advised a possible cause was excessive heat exposure. Submitter recommended the pack incorporate external voltage checkpoints, and the ELT should contain an insulated cover or be installed out of direct sun. Unit was installed in a Cessna 150. |
| NARCO ELT-10 | Battery case warped, and battery leakage caused the ELT antenna to corrode. |
| NARCO ELT-10<br>Battery P/N 57674-0001 | The ELT battery was found to have zero voltage. Condition was found in May 1982. Battery replacement date was July 1982. |
| NARCO ELT-10 | The whip portion of the ELT broke off the aircraft flush with the mounting on a Mooney M21. Rust and corrosion contributed to the antenna breaking. |
| NARCO ELT-10<br>ARTEX Battery P/N 00-10-006 | An odor was observed near the tail of the aircraft. Investigation revealed the battery was very hot and visibly swelling. The parting area between the battery and unit was venting steam. Unit was removed from aircraft. |
| NARCO ELT-10<br>Battery P/N 57674-0001 | The ELT battery was removed for replacement. The top cell epoxy was cracked with some acid spillage. |
| NARCO ELT-10<br>Battery P/N 57674-0001 | Corrosion was found on one cell when the battery was removed for replacement. The plastic case appeared to have been hot. The ELT was mounted in the tail section of the aircraft. The battery output voltage was 0.74 volts. |

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# MAINTENANCE NOTES

## BALLOON ENVELOPE MATERIAL

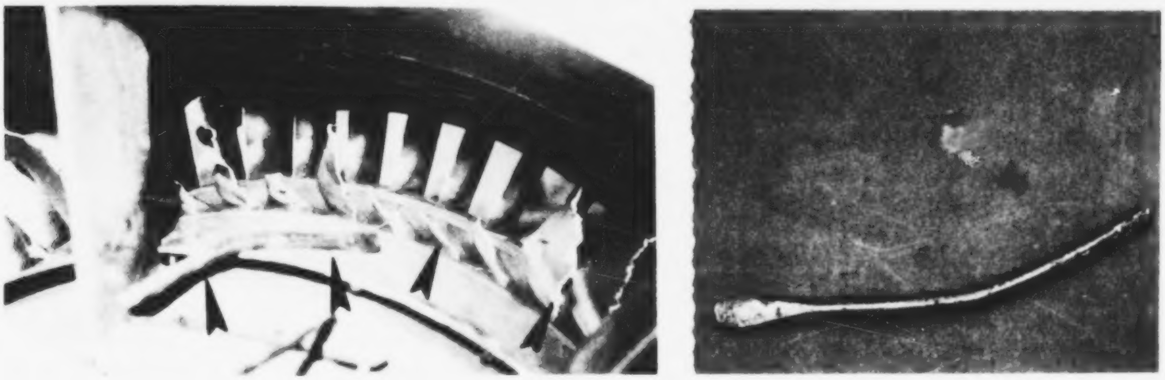
Balloon envelope material is often mistakenly identified. Repairs have been found where improper materials not "equal to or better" than original have been utilized.

Use of the improper materials has probably occurred because of the apparent similarity to parachute fabric or other yard goods available on the textile market.

Balloon manufacturers advise that the original envelope material is purchased in compliance with very rigid specifications involving such details as: porosity, treatment to resist ultraviolet light, coatings to resist heat from burners, rip-stop features, thread count, and strength.

Several balloon maintenance manuals specify use of cloth supplied by the manufacturer only to insure use of proper material.

The aviation balloon maintenance community should strictly follow the balloon manufacturer's maintenance manual and service bulletins to insure proper selection of materials for making envelope repairs.



**$300,000.00 SCREWDRIVER**

COST TO REPAIR CF700 ENGINE

## THE ENEMY

I AM more powerful than the combined armies of the world. I have destroyed more men than all the wars of all nations. I massacre thousands of people every year. I am more deadly than bullets, and I have wrecked more homes than the mightiest guns.

In the United States alone, I steal over 500 million dollars each year. I spare no one, and I find my victims among the rich and poor alike, the young and old, the strong and weak. Widows know me to their everlasting sorrow. I loom up in such proportions that I cast my shadow over every field of labor.

I lurk in unseen places and do most of my work silently. You are warned against me, yet you heed me not. I am relentless, merciless, and cruel. I am everywhere – in the home, on the streets, in the factory, at railroad crossings, on land, in the air, and on the sea.

I bring sickness, degradation, and death, yet few seek me out to destroy me. I crush, I maim, I will give you nothing and rob you of all you have.

I am your worst enemy – I am CARELESSNESS.

Author Unknown – APPROACH/ February 1980

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U.S. Department
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**AC No. 43-16**

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# ALERTS

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**November 1982**

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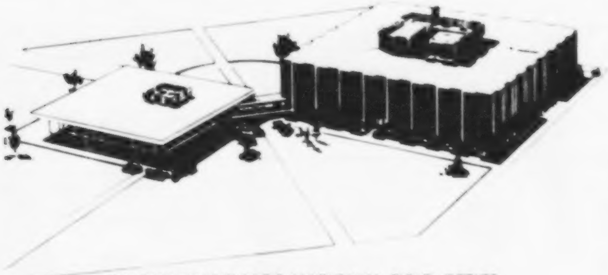
ADVISORY CIRCULAR
AC 43-16

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

# GENERAL AVIATION AIRWORTHINESS ALERTS

NOVEMBER 1982



FLIGHT STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Flight Standards National Field Office, Attn: AFO-580, P. O. Box 25082, Oklahoma City, Oklahoma 73125.

# AIRCRAFT

## AEROSPATIALE

| | | |
|---|---|---|
| Aerospatiale Models AS-350D and AS-355 | Tail Rotor | There have been reports of failure of the No. 3 and No. 4 bearings on low-time aircraft. The reports were of corroded inner and outer bearing races, bearings spinning on the shaft, and bearings losing grease through the grease seal. |
| Aerospatiale Model AS-350D | Safety Wire | The safety wire tail on the tail rotor driveshaft coupling nut had contacted and worn a .030-inch deep groove in the nonrotating pitch-change spider arm. The new replacement assembly was safetied in the same manner. Inspection of another AS-350 helicopter disclosed the same condition. There was very little clearance between the rotating nut and the nonrotating arm. The safety wire tail would have to be bent close to the nut and remain there. Submitter recommends reversing safety from nut to tab rather than tab to nut and checking stock units for safety wire tails that could cause damage. |

## BALLOON WORKS

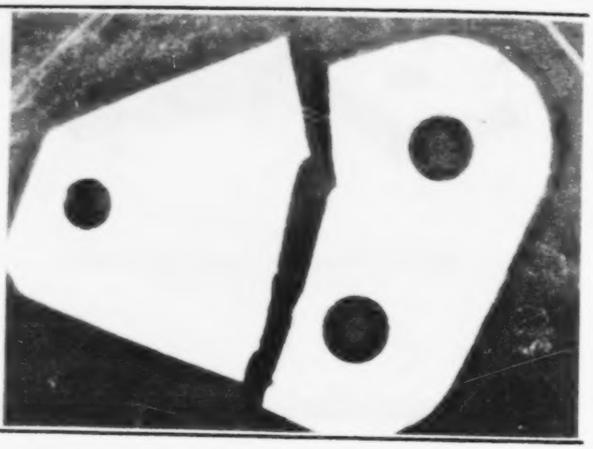
| | | |
|---|---|---|
| Balloon Works<br>Model Barnes<br>Firefly 7 | Load Cord<br>Stitching | The stitching that holds the load cords to the fabric was found broken in spots, exposing the load cords. Submitter advises this could be a potentially dangerous situation in that the load cords are the structural members for the envelope. Also, a chainstitch is used to secure the load cords; and if this stitch is broken, it can snag and unravel indefinitely. Submitter recommends all Barnes owners be advised and the load cords be inspected to ensure this problem does not exist in large numbers. |

## BEECH

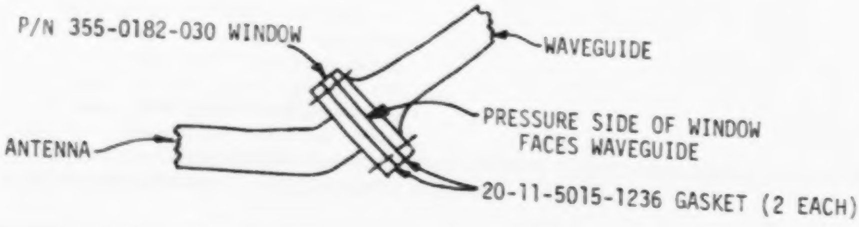
Beech
Model C24

Throttle Bracket

The engine went to full RPM during flight. An investigation disclosed a broken throttle bracket. A new bracket of heavier material was fabricated and installed. Aircraft time—500 hours.



| | | |
|---|---|---|
| Beech<br>Model B90 | Nose Gear Brace<br>P/N 50-820204-3 | During a 100-hour inspection, a paint bubble was found on the upper aft portion of the nose gear brace. The paint bubble was removed, and a small hole extended through the brace. Disassembly of the nose gear disclosed severe intergranular corrosion throughout the cylinder portion of the nose brace. Submitter recommends disassembly of the nose gear for corrosion inspection each 5 years. |
| Beech<br>Models C90,<br>E90, and F90 | Collins Weather Radar<br>WXR-250 and WXR-300 | King Air airplanes with Collins WXR-250 or WXR-300 weather radar installed should be inspected to verify that an RF window is installed properly at the waveguide/antenna interface (reference sketch). The RT unit should also be inspected to assure that an RF window is not installed between the RT and the pressurized air adapter or between the adapter and the waveguide. |


P/N 355-0182-030 WINDOW
WAVEGUIDE
PRESSURE SIDE OF WINDOW FACES WAVEGUIDE
ANTENNA
20-11-5015-1236 GASKET (2 EACH)

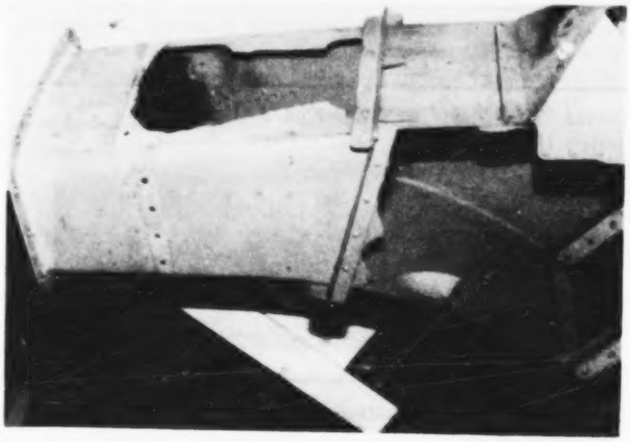
## BELLANCA

| | | |
|---|---|---|
| Bellanca<br>Model 7ECA | Rusted Gear Struts | Rust was found around the steps which were clamped to the landing gear spring struts. The clamped steps were removed, and the rust was to the point of starting pits into the struts. This aircraft had been exposed to the elements, and apparently, moisture had accumulated under the step clamps. Submitter recommends inspection of the areas and removal of the clamps if rust is suspected. |
| Bellanca<br>Model 7GCBC | Gear Attach Bolt<br>P/N MS20005-32 | The right gear folded when the brakes were applied during taxi. An investigation disclosed the gear attach bolt had broken. The bolt and the attach tube were corroded, and water was inside the attach tube. The aircraft was manufactured in 1969 and had accumulated 3,700 hours flight time. |

## BRITISH AEROSPACE

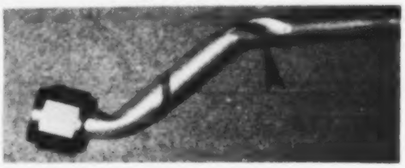
| | |
|---|---|
| Hawker Siddeley<br>Model BH.125-400A | Ram Air Inlet Duct<br>P/N 25VF1399AC |

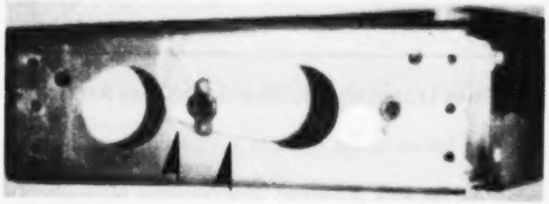
Pieces of metal were found on the floor under the auxiliary power unit. An intensive search revealed the ram air inlet duct was shattered. The condition of the duct was believed to have been caused by vibration. Submitter advises it is very difficult to gain access to the duct for inspection. Aircraft time—4,544 hours.



## CESSNA

| | | |
|---|---|---|
| Cessna<br>Model 150M | Nose Strut Assembly | The nose gear was found loose during an inspection. Further inspection revealed the roll pin, P/N NAS 561P12-48, was nearly sheared, and the lower attach bolt was bent. The roll pin hole in the upper strut was also elongated. The nose gear was not found loose during a prior hard landing inspection. Submitter recommends removal and inspection of the roll pin and lower attach bolt after hard landings. |
| Cessna<br>Model 152 | Elevator Bellcrank<br>Bushings Worn | When checking the elevator travel during an annual inspection, the elevator would still go up after contacting the stop. An investigation disclosed excessive play in the bellcrank center bushing. The same condition, excessively worn bellcrank bushings, was found on seven other aircraft. New aft elevator bellcrank bushings were installed in eight aircraft. Average aircraft time in service—200 hours. |

| | | |
|---|---|---|
| Cessna<br>Model 172F | Fuel Line | The fuel line from the selector to the fuel filter was found almost chafed through the tubing wall. Aircraft time—2,000 hours.<br> |
| Cessna<br>Models 172, R172K, F172, and FR172 | Control Yoke Guide Assembly | There has been a report of an in-flight loss of control occurring when the right-hand control wheel was forced full forward with an accompanying side load. This caused the control wheel guide roller to come out of its track and jam in the full nose down position. The instructor pilot was able to forcibly override the jammed condition and make a successful landing.<br>To prevent a recurrence, Cessna has issued Service Information Letter No. SE82-38 which provides details of a simple modification to the roller guide track. It is recommended this service letter be complied with at the next 100-hour or annual inspection.<br>Airplanes affected:<br>Model 172, S/N's 17266940 through 17275759<br>Model R172K, S/N's R1722000 through R1723454<br>Model F172, S/N's F17201445 through F17202194<br>Model FR172, S/N's FR17200591 through FR17200675 |
| Cessna<br>Models 182P and 182Q | King KS272 Manual Electric Pitch Trim Servo | The manual electric pitch trim servo should be checked to determine if the stop-to-stop time is within 40 ± 8 seconds. If the trim speed is found to exceed this limit, the pitch trim servo should be replaced in airplanes with 28-volt electrical systems and modified in airplanes with 14-volt systems. King Radio Corporation Alert Installation Bulletin No. 215 and Service Bulletin No. KS272-3 (065-0029-21) both dated July 13, 1982, provide details about this problem and necessary corrective actions.<br>Aircraft affected: S/N's 18260826 through 18267715 modified per STC SA1296CE |
| Cessna<br>Models 100 and 200 Series | Fuel Tank Drains | Many Cessna 100 and 200 series airplanes are equipped with fuel reservoirs (separate tanks) in addition to the wing fuel tanks. On these airplanes, the fuel reservoirs as well as the wing fuel tanks should be checked for contamination when water or other contaminants are found in the fuel system. Refer to the appropriate Cessna Owner's Manual for fuel reservoir location and proper draining procedures. In addition, Cessna Service Information Letter No. SE79-45 provides data for the installation of fuel tank quick drain kits which are now available for airplanes built between 1946 and 1974. |
| Cessna<br>Model P210N | Nose Strut Centering Collar | The pilot reported the nose steering was not normal. An inspection revealed that with the strut extended against the steering collar, the nosewheel was turned slightly to the left. Further inspection disclosed the bolt that secures the centering collar to the upper strut had sheared. This resulted in failure of the nosewheel to center properly. The same condition was found on a T210N. Submitter advises a probable cause is turning the nose gear with the strut fully extended. Submitter recommends securing the collar at the three points provided instead of one point. This would help eliminate the problem. |

| | | |
|---|---|---|
| Cessna<br>Model T210N | Loose Screw<br>P/N AN520-3R10 | During the beginning of a right turn, the pilot felt the elevator and aileron controls lock in that position. The pilot overcame the resistance and landed. During landing, the controls locked again. An inspection disclosed the bottom screw which held the electrical plug-in header, P/N 3428-1002, to the mount bracket (located next to the control column) had fallen into the control gimbal and locked the controls. Inspection of two other T210N and three P210N aircraft revealed three of these aircraft had the identical screws loose. One of the aircraft inspected had the nut and spacer missing from the top, and the bottom screw was loose. The total time on the aircraft with loose screws averaged 121 hours and ranged from 13 to 186 hours. On all the aircraft checked, the screw installation was installed backwards as compared to the illustration in the Cessna Parts Manual. Also, none of the screws checked contained lockwashers which the parts illustration depicts. Because no locking device is installed, it appears that the screw works loose and falls out. With the screw on the side of the mount bracket (backwards to parts illustration), should it fall out, it can easily lodge in the control gimbal which would create a potential hazard. |
| Cessna<br>Model T303 | Engine-Mount<br>Heat Shields | Cessna has developed an engine-mount heat shield kit to improve the service life of the engine outboard shock mounts. The kit is numbered SK303-3 and described in Cessna Service Information Letter No. ME82-13. It is recommended that this kit be installed at the next annual or 100-hour inspection. |
| Cessna<br>Model 340A | Cracked Rib<br>P/N 0831311-1 |  |

There have been several reports of cracked rudder balance weight support ribs. Cessna Service Letter ME82-8 pertains to the problem.

NOTE: A related article is found in Alert No. 47, dated June 1982.

| | | |
|---|---|---|
| Cessna<br>Model 441 | Horizontal Stabilizer<br>Attach Bolts | Light vibration was observed during descent at 190 knots. An investigation revealed the right forward horizontal stabilizer attach bolt had zero torque. The left forward attach bolt had less than 25 inch-pounds torque. Further investigation revealed the P/N MS20002-8 washers were grooved out under the nuts. Submitter recommends inspection of the area at each 200 hours of operation. Aircraft time—433 hours. |
| Cessna<br>Model 550 | Chafed Wire | The speed-brake circuit breaker would intermittently pop when the speed brakes were actuated. The problem was finally found to be a wire chafing on an inspection plate screw in the left wing flap area near the speed-brake actuator. Repairing and securing the wire solved the problem. Aircraft time—472 hours. |

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|---|---|---|
| Cessna<br>Models 550<br>and 551 | Goodyear<br>Main Wheel Assembly<br>P/N 5003783 | It is recommended that the double countersink washers, P/N MS14155-5, on the wheel tie bolts be checked for cracks at the next tire change or wheel overhaul. All washers on a tie bolt assembly should be replaced if one or more of the washers are found cracked. Failed washers will remain in a counterbore at the bolt location and cannot come out of the position until the wheel is disassembled.<br>Cessna Citation Service Letter No. SL550-32-14 provides further details regarding inspection and replacement of cracked washers.<br>Aircraft affected: Models 550/551<br>Unit numbers: -0002 and subsequent. |

## FAIRCHILD INDUSTRIES

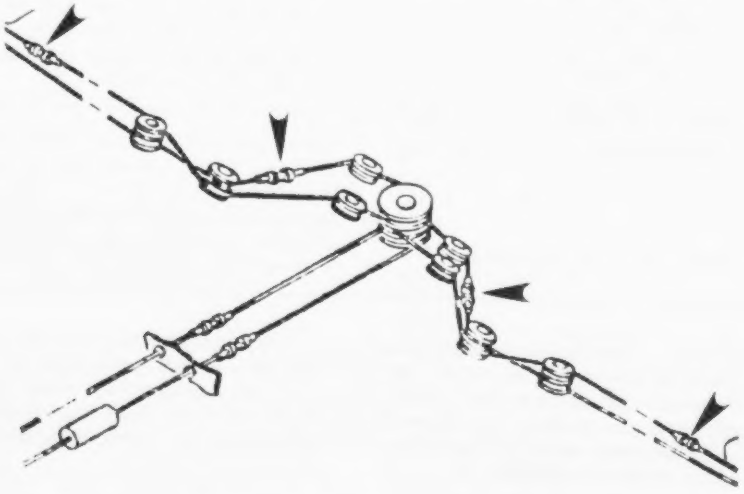
| | | |
|---|---|---|
| Fairchild<br>Model FH-227 | Aileron Cable<br>P/N 27-720018-231 | Right aileron droop was observed during the pre-flight inspection. An investigation disclosed the outboard aileron cable had broken where the cable passes through a fair-lead. The identical condition was found on the left outboard aileron on another FH-227 aircraft. It was reported that both aircraft had been parked in an area that was subject to jet blast from Boeing 727 aircraft. |

## GATES LEARJET

Gates Learjet Models 20 and 30 Series Aircraft—Maintenance Manual Illustration Correction

The following information is contained in Gates Learjet Service News Letter No. 67, dated January 1982:

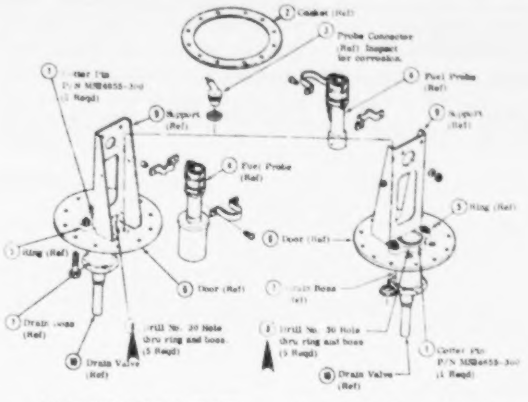
"All 20 and 30 series Maintenance Manuals and Illustrated Parts Catalogs that reference wing aileron cable runs have pictures depicting turnbuckles in the wrong place. There is, in fact, a turnbuckle in each cable run. Technical Publications is in the process of revising all applicable manuals. Until such time, if any questions arise about aileron cable runs, feel free to contact GLC Field Service. (Figure below shows correct cable run.)"



Gates Learjet Fuel Probe Drains
Models 24 and 25

Gates Learjet has issued Service Bulletin SB24/25-315, dated January 29, 1982, to add drain holes in the inboard fuel probe access doors. Without proper drainage, the capacitance-type fuel gauge system may become inaccurate due to water contamination or corrosion.

Aircraft affected: S/N's 24-160 through 24-189; and 25-011 through 25-029.


2 Gasket (Ref)
3 Probe Connector (Ref) Inspect for corrosion.
1 Cotter Pin P/N MS24665-300 (1 Reqd)
9 Support (Ref)
4 Fuel Probe (Ref)
9 Support (Ref)
4 Fuel Probe (Ref)
5 Ring (Ref)
6 Door (Ref)
5 Ring (Ref)
6 Door (Ref)
7 Drain Boss (Ref)
7 Drain Boss (Ref)
Drill No. 30 Hole thru ring and boss. (5 Reqd)
8 Drill No. 30 Hole thru ring and boss (5 Reqd)
8 Drain Valve (Ref)
8 Drain Valve (Ref)
1 Cotter Pin P/N MS24665-300 (1 Reqd)

LH INBOARD FUEL PROBE ACCESS DOOR RH INBOARD FUEL PROBE ACCESS DOOR

## GENERAL DYNAMICS

CONVAIR 240/340/440 and All Modified Models—Tail Vibration

A recent incident and several reports of tail vibration or flutter indicate that greater emphasis should be placed on the inspection and maintenance of the empennage of these aircraft. Any one or combination of the following can induce vibration or flutter: worn hinge brackets, bushings, or hinge bolts or pins; cumulative free-play in control activating mechanisms; and loose or broken balance weights.

Owners and operators should review their inspection programs to ensure they provide adequate detailed inspection of these items and the remainder of the empennage. Manufacturers' recommendations should be followed. The following manufacturers' publications provide further information:

Convair

640(340D) SB No. 27-1 – Rudder and Elevator Hinge Pin and Bushing Assembly
640(340D) SB No. 55-1 – Stabilizers—Addition of Vertical and Horizontal Stabilizer Shroud
600(240D) SB No. 55-2 – Hinge Pin Retention Brackets
Newsletter No. 247 – Hinge Pin Installation—Rudder and Elevator

Allison

Service Letter PJCSL No. 26 – Inspection of Elevator Trim and Flight Tab
Service Letter PJCSL No. 37 – Elevator Hinge Pin

## GULFSTREAM AMERICAN

Gulfstream American Gill Battery
Models AA-1 and AA-5

There are reports of finding the Gill battery, P/N PS6-9, installed in Gulfstream American AA-1 and AA-5 aircraft. This battery is too tall; and when the cover is installed, the battery vent plugs are blocked. Gulfstream American Service Letter (Grumman) No. 75-2 states that the Gill PS6-9 battery is not approved for the AA-1 and AA-5 aircraft. It was reported that the Gill battery applicability chart lists the PS6-9 as a replacement battery for these aircraft—which could be contributing to the problem. Be aware!

NOTE: The above article was published in Alert No. 45, dated April 1982. Reports continue to be received of venting problems with the Gill PS6-9 battery installed in AA-1 and AA-5 aircraft. The Gill PS6-9 battery is not approved for the AA-1 and AA-5 aircraft according to Gulfstream American Service Letter (Grumman) No. 75-2. Owners and operators of these aircraft should be aware.

## MITSUBISHI

Mitsubishi
Model MU-2B-26A

Flap Cable Drive

A loud noise was heard on the right side of the aircraft when the flaps were extended during the pre-flight inspection. An investigation revealed the outboard flap actuator drive flex shaft had failed. The inboard actuator extended while the outboard actuator did not extend. There was extensive damage to the outboard flap and wing trailing edge. Airworthiness Directive 75-02-01 applies to flap drive cable problems but does not include the MU-2B-26A or serial number of this aircraft. These cables have a mandatory service life of 2,000 hours. The right flex shaft failed at 1,100 hours, and the left was replaced because of binding. No frictional noise was heard from the binding left cable when checked in accordance with the Airworthiness Directive.

## MOONEY

Mooney
Model M20D

Gear Retraction
Lever P/N 5600011

The landing gear collapsed during rollout after landing. An investigation disclosed the gear retraction lever assembly had broken. There were indications of previous cracks at the failed areas. Aircraft time—2,642 hours.

## PIPER

Piper
Model PA-22-150

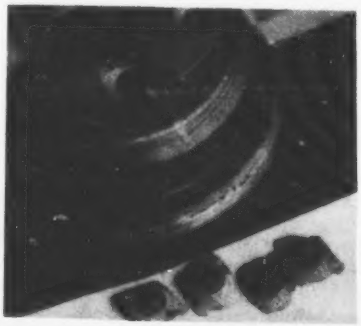
Oleo Strut Bearing
P/N 452419

The rudder jammed when the aircraft was in a left turn during flight. An investigation revealed the nose gear oleo strut upper bearing had seized while in the left turn. The new-type sealed bearing and a boot had been installed in 1967 in accordance with Airworthiness Directive 64-05-04. The boot was missing when the area was inspected. Submitter recommends that aircraft be inspected for missing boots and bearing condition.

Piper
Model PA-23-250

Cracked Main Wheel

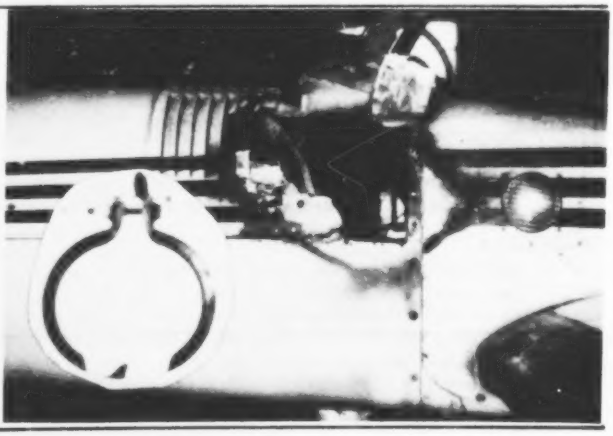
During a routine tire change, the inboard wheel half capture nuts were found pulled from the wheel half. The surrounding metal was cracked, and one bolt was sheared. The axle nut was holding the wheel on the aircraft. Wheel total time—1,000 hours.



| | | |
|---|---|---|
| Piper<br>Model PA-28-140 | Horn Assembly<br>P/N 63300-08 | During a 100-hour inspection, the nosewheel steering horn assembly was found bent, and the right stop bolt was bent upwards allowing excessive travel. The shimmy dampener ball end bearing was also bent forward of the checknut. Probable cause was exceeding turn limits while moving the aircraft with a tug. |
| Piper<br>Model PA-28-161 | Fuel Tube<br>P/N 67700-56 | The fuel tube was corroded and leaking where the left interior panel contacts the tube. Two aircraft were found with this condition. Submitter advised he placed a neoprene hose over the fuel tube to prevent the interior panel from contacting the tube. Aircraft times—448 and 1,184 hours. |
| Piper<br>Model PA-28-161 | Ignition Switch<br>P/N 69997-3 | The pilot observed the ignition key could be removed from the switch with the switch in ALL position, leaving the magneto hot. The Gerdes part number for the switch is A-510-10. Aircraft time—149 hours. |
| Piper<br>Model PA-28RT-201T | Stop Assembly<br>P/N 37970-02 | While performing Airworthiness Directive 82-06-11, the rubber bumper up-stop was found missing. The missing stop allowed the nose gear to retract too high which damaged the P/N 67271-00, hat section fairing. Aircraft time—228 hours. The stop assembly was found missing on other PA-28R aircraft. |
| Piper<br>Model PA-30 | Engine Mount<br>P/N 23561-31 | The lower mount legs were found burned and pitted in the area where the turbo exhaust passes under the mount. The mount leg was burned through the tubing in one spot, whereas the pitting was approximately 60 percent of the wall thickness. There was no reported failure of the turbo exhaust system in this case. Time on the aircraft—2,834 hours. |
| Piper<br>Model PA-31P | Burned Resistor<br>P/N 48430-00 | Smoke came out from under the right instrument panel during cruise flight. The cigar lighter had been used just prior to observing the smoke. An after-landing investigation revealed the cigar lighter resistor had burned its phenolic backing and 1 foot of rubber static hose that was routed behind the resistor. To prevent recurrence, the submitter suggests removal of the cigar lighters or changing the lighters to a 24-volt system. |

| | |
|---|---|
| Piper<br>Model PA-31 | Broken Turbo Coupling<br>P/N 556 962 |

There was a fire in the left engine nacelle just prior to landing. The fire went out when the engine was shut down, and the pilot landed the aircraft without further incident. An investigation revealed the turbocharger exhaust clamp had broken at the heel. Airworthiness Directive 79-12-03 had been complied with 73 hours prior to failure. There are similar reports of failure of the P/N 556 053, turbocharger exhaust clamp. Emergency Airworthiness Directive 82-16-05 (which supersedes Airworthiness Directive 79-12-03) and Piper Service Bulletin No. 664B pertain to the problem.



### ROBINSON

| | | |
|---|---|---|
| Robinson<br>Model R22 | Battery Cables | The aircraft developed intermittent electrical power loss problems. All electrical equipment, including the rotor tachometer, would temporarily become inoperative. A thorough investigation disclosed that both the positive and the negative battery cable terminals were broken at the battery. The plastic shrink tubing over the cable terminals was holding the broken areas together and also hiding the broken terminals. Replacing the battery cables solved the problem. Aircraft time—380 hours. |

### SWEARINGEN

| | | |
|---|---|---|
| Swearingen<br>Model SA226–TC | Missing Bolt | The pilot could not reduce left engine power prior to landing. The engine was shut down, and the aircraft was landed without incident. An investigation revealed the nut had come off the bolt holding the power lever rod end to the propeller pitch control. Neither the bolt nor the nut were found. Submitter recommends installing an AN bolt and castellated nut with cotter pin in lieu of the self–locking nut. |

## ACCESSORIES

### SLICK

| | | |
|---|---|---|
| Slick<br>Magneto<br>Model 4251 | Impulse Coupling<br>Spring P/N M3163 | The pilot advised the engine was difficult to start on a PA–28–161. An investigation disclosed the magneto impulse coupling spring was very weak. Two other recently overhauled magnetos were installed, and both malfunctioned because of weak springs. All three magnetos had been overhauled by a Slick repair facility. |

## ENGINES

### LYCOMING

| | | |
|---|---|---|
| Lycoming<br>Model IO–540–K1GB | Crankcase Assembly | Many gaskets and seals had been replaced in an effort to stop an oil leak. The engine was on a PA–32–300 and had 655 hours total time. Two other aircraft with the same engine models had oil leak problems, and seals and gaskets had been replaced on these engines. The oil leak was finally traced to a sand casting flaw in the oil gallery forward of the No. 6 cylinder. The same type leak was discovered at the same location on all three engines. |

A MINUTE FOR SAFETY IS BETTER THAN A MONTH FOR REPAIRS.

# PROPELLERS

## HARTZELL

| | | |
|---|---|---|
| Hartzell<br>Model HC-B4TN-5DL | Expansion Plug | There have been three recent reports of being unable to balance the propellers from MU-2B aircraft. Disassembly of one propeller disclosed the No. 1 expansion plug was completely dislodged, and No. 3 was loose. Disassembly of two other propellers revealed that one of the expansion plugs was dislodged, and the pilot tubes were full of grease causing an unbalanced condition. Propeller times—160 to 1,020 hours. |

# MAINTENANCE NOTES

## WHERE THERE IS FROST ON THE PUMPKIN—THERE COULD ALSO BE FROST ON THE AIRCRAFT

Everything that concerns us here has to do with one simple, natural phenomenon: Water freezes at 0° C (32° F). By whatever name it is called—ice, snow, sleet, frost, or hail; water at or below 32° F can be a problem inside, outside, around, and under the aircraft. Aircraft easily accumulate snow, ice, and frost. Snow and ice are obvious and must be removed before flight. Frost, however, is more deceptive. Frost not only increases gross weight; it drastically alters the lift-drag ratio of an aircraft, making takeoff extremely hazardous. There is no such thing as a little frost on aircraft surfaces. The only conditions that apply are *none* or *some*—and *some* is too much when ice or frost is discovered on aircraft surfaces. Never risk aircraft damage by chipping or scraping it off; let the warmth of a hangar or deicer do it gently.

Where removal of deposits must be accomplished outside, the use of a nonflammable deicing fluid such as one containing a glycol base (either ethylene or propylene) has been found quite effective. This type of remover has an additional advantage in that the slow rate of evaporation coupled with its viscosity leaves a protective film on the surfaces which dissipates slowly, thereby providing a latent degree of protection.

If nonflammable fluid is not available, it is permissible to use a deicing fluid containing an alcohol base, provided certain precautions are exercised. Assure that the fluid is applied sparingly near engine and APU (auxiliary power unit) exhaust gas areas to avoid accumulations that might ignite when engines or the APU is started. Where the APU tailpipe or engine exhaust gases are emitted in the vicinity of affected surfaces, to reduce the fire hazard, assure that the pertinent powerplant is shut down before applying the deicing fluid. But remember to make sure that there is no melted ice (water) on the aircraft that can refreeze on surfaces, in flight control areas, and landing gear mechanisms when they are out in the cold again. Small quantities of water accumulating in places such as control surfaces may create a condition of static unbalance that would seriously impair the operational control of the aircraft in flight.

For these reasons, it is always a good practice to check drain holes in wings, stabilizers, flight control surfaces, fuselages, and airscoops to make sure they are unobstructed and capable of serving their intended purpose. Systems should be checked for the presence of water, in accordance with the appropriate aircraft manufacturer's recommendations. Special attention should be paid to deicer boots and prop deicers.

An item responsible for many problems, if neglected, is the landing gear of aircraft operating from surfaces covered with mud, snow, and slush. On retractable-gear aircraft, the integrity of shields, boots, and curtains used to protect actuating devices, switches, etc., must be maintained. In addition, retraction mechanism lubrication, in accordance with the manufacturer's recommendations, cannot be overstressed. Oleo struts should be serviced with nitrogen for winter operations. Otherwise, ice crystals can form in the hydraulic fluid and cut the seals. The struts should also be wiped with clean hydraulic fluid to remove snow, ice, and dirt.

Fuel filters and sumps (including each tank sump) should be equipped with quick drains. Sufficient fuel should be drawn off into a transparent container to see if the fuel is free of contaminants. Extra care should be taken during changes in temperature, particularly when it nears the freezing level. Ice may be in the tanks, which may turn to water when the temperature rises, and may filter down into the carburetor or fuel controller, causing engine failure. During freezeup in the fall, water can freeze in lines and filters causing stoppage. A small amount of water which is frozen can prevent proper operation of fuel pumps, selector valves, and carburetors.

Cold weather operation of the aircraft engine involves conditions that require special preparations and precautions as compared to normal weather operation. Vaporization of the fuel becomes difficult, and the high viscosity of oil causes reduced cranking speed with accompanying high loads on the starter. Often the accessories fail because of congealed oil. This is very evident by the increased number of oil cooler failures on reciprocating engines in cold weather. Excessive priming washes the oil from the piston rings and cylinder wall, causing piston scuffing and scoring of the cylinders.

When facilities are not available for aircraft to be stored inside, it may be necessary for oil to be diluted after the last flight of the day. This practice lowers the viscosity of the oil and enables the engines to be started more easily. The problems facing personnel in this operation will be an excessive amount of carbon in oil screens and possible lower oil pressure. All personnel involved should familiarize themselves with recommended procedures.

The importance of engine temperatures: cylinder head, oil, and carburetor air heat cannot be overemphasized. Attention to detail such as warming up the engine before takeoff and allowing the engine to cool down prior to shutting it off pays dividends in many ways, especially at overhaul time. Good practices in this item would also include a check of the carburetor air heat system and the degree of heat rise available. At the same time, the engine idle RPM and mixture, with and without carburetor air heat, should be checked. Many forced landings could have been avoided if this one check had been made beforehand. Carburetor heat systems should be in peak condition during winter months of operation and at altitudes where moisture freezing prevails. Timely application of carburetor heat is essential to safe operation.

Another cold start problem that plagues an engine that has not been preheated is icing over the spark plug electrodes. This happens when an engine only fires a few revolutions and then quits. There has been sufficient combustion to cause some water in the cylinders but insufficient combustion to heat them. This little bit of water condenses on the spark plug electrodes, freezes to ice, and shorts them out. The only remedy is heat. When no large heat source is available, the plugs are removed from the engine and heated to the point where no more moisture is present.

The crankcase breather deserves special consideration when preparing for cold weather. Frozen breather lines have created numerous problems. Most of the water of combustion goes out of the exhaust; however, some water enters the crankcase and is vaporized. When the vapor cools, it condenses in the breather line subsequently freezing it closed. Special care is recommended during the pre-flight to assure that the breather system is free of ice.

Jet engines can accumulate internal ice overnight and resist rotation when starting is attempted. With any indication of locked rotor, unusual noise, or low RPM, discontinue the start. The procedure here is fundamental. The point is to be aware that the rotors could freeze on any cold weather start and to be alert enough to discontinue the start before damaging the engine. When weather forecasts include snow, ice, or sleet; engine cowl plugs for jet engine inlet and outlet openings should be installed if aircraft is to be exposed to the elements.

## CAUTIONS OF A PERSONAL NATURE

Maintenance personnel should wear heavy, nonstatic clothing. Static electricity can be generated while wearing clothing such as the standard, nylon-type jacket. Most of us know that touching bare skin to cold metal surfaces can flash freeze our skin and cause it to stick to that surface: wear gloves.

Climbing ladders or walking on aircraft surfaces can be very dangerous. Truck beds and maintenance platforms are other hazardous areas that can ice over very quickly.

Running-up aircraft engines develops a dangerous chill factor. Everyone working on the flight line should avoid prop blast whenever possible.

All personnel must understand the chill factor as it applies to outside temperatures and winds. Remember, the higher the index number, the greater the exposure damage to living tissue—unless proper cold weather precautions are taken.

## WINTER SPINNER TIP

A recommendation has been made to remind both maintenance and operations personnel to leave the propellers on aircraft in a position that will reduce the chances for water to accumulate in the spinner cavities. Water in such places will subsequently freeze while the aircraft is not in use during cold weather. When this occurs, the resultant unbalance will produce loads that lead to spinner damage if the powerplant is started and run at higher RPM.

## FROZEN BREATHER TUBES

Several reports of complete engine oil loss from blown crankshaft seals were received during the past winter months. The cause for blown seals was excess case pressure because the engine breather tube was frozen.

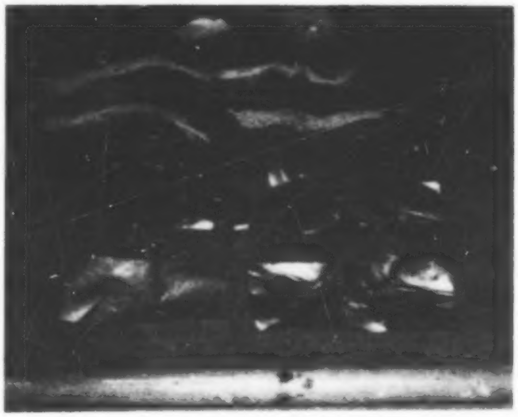
The reports were on Cessna 170B, R172, and Piper PA-28 aircraft with Lycoming O-360 or IO-360 engines installed. There was one report on a PA-24 aircraft with the Lycoming O-540 engine installed. There was also one report on a Gulfstream American (Rockwell) 112 aircraft with the Lycoming IO-360 engine installed. This report stated that Gulfstream American (Rockwell) Service Bulletin No. SB 112-50, "Engine Breather Tube Modification," had been complied with previously.

Piper Service Letter No. 370, "Modification to Engine Breather Line," pertains to certain PA-24 aircraft.

# OF INTEREST

## COMPLETE THE JOB

Four pieces of duct tape totaling 2 feet in length and a 1- foot long stick were removed from an aircraft fuel cell. The fuel dissolved the tape glue allowing the gauze to separate and float in the cell. Apparently, the tape was put in the cell under the snaps, and the stick was used to push the snaps in place. Probably, a rush job, and someone failed to complete the installation by not removing the *assist* tools. Records indicate the debris was in the tank for more than 2 years.



## WEAR TIGHT PANTS!

The pilot's trouser leg became entangled in the water-rudder retracting handle causing loss of rudder control during a water takeoff in a Cessna 185F. The aircraft was damaged when it hit a moored utility barge. Care should be taken regarding boots, flared trousers, or jeans that could interfere with the water rudder lever.

## QUESTION—ANSWER

Question: I often ferry new aircraft which have Lycoming engines installed and a tach reading of 1 to 4 hours. Due to the high cost of fuel, I would like to use power settings as low as 55 percent of power for cruise. My question is: Are these Lycoming engines broken-in well enough so that I can use 65 percent or even 55 percent power for cruise during the 18 or 20 hours of ferry time?

Answer: Your concern over aviation fuel costs and desire to conserve are understandable. Unfortunately, the period of time you are ferrying the aircraft is the most critical for proper engine break-in, and power settings of 70 to 75 percent should be consistently used for cruise. Since it may take 25 to 50 hours before the rings are completely seated, it would be a disservice to the eventual owner of the aircraft to do the initial cruising at the economy power settings. There is a possibility that this would cause the cylinder walls to glaze. This would result in high oil consumption and possibly a need to remove and deglaze the cylinders. The expense to a new airplane owner would certainly not be welcome.

Avco Lycoming Flyer

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December 1982

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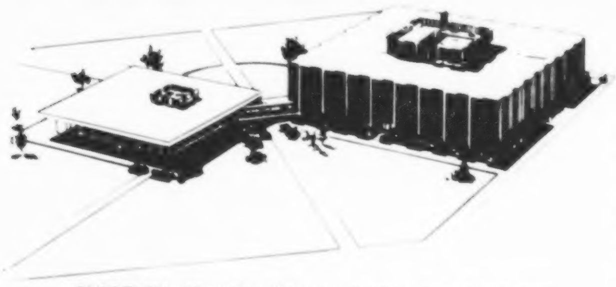
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

ADVISORY CIRCULAR
AC 43-16

# GENERAL AVIATION AIRWORTHINESS ALERTS

DECEMBER 1982



AVIATION STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

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## AIRCRAFT

### ALEXANDER SCHLEICHER

| | | |
|---|---|---|
| Alexander Schleicher<br>Glider Models<br>K8, KAB8, K8B, K8C | Canopy Lock | The canopy hoods are opening during flight due to possible wear on cockpit canopy hood locks. Alexander Schleicher Technical Note (TN No. 21) contains inspection and repair instructions to ensure a minimum cam slot depth of 2mm. A 2mm cam slot will minimize the probability of canopy hood opening during flight and reduce situations that could jeopardize the safety of the flight. |

### BEECH

| | | |
|---|---|---|
| Beech<br>Model C99 | Shorted Wire<br>P/N X6B20 | Both inverters failed during an ILS approach. An investigation disclosed the subject wire, which is connected to the 115 volt inverter select relay, was run behind the internal panels and not secured. The bare wire shorted to a bulkhead causing failure of both inverters and the select relay. Submitter advised the wire is identified in the Beechcraft diagram as being capped and stowed. Aircraft time—114 hours. |

Beech Model 65-90 through E90 Aircraft—Landing Gear System

The following information is reprinted from Beech King Air 90 Communique No. 92, dated June 11, 1982:

"The bolt connecting the LG gearbox to the long torque shaft on Model 90 thru E90 King Airs could be an AN3, AN4, or AN5, depending on the airplane S/N and compliance with old Service Letter/Bulletin. The two Parts Catalogs (90/A90/B90 IPC and C90/E90 IPC) have conflicting information on this particular bolt. The following summary gives additional info and should be noted in the two IPC's and the Maintenance Manual pending revisions.

1. The original AN3-14A bolt was replaced with an AN386-1-11 taper pin starting at S/N LJ-117. Service Letter No. 66-29 recommended this change for S/N LJ-1 thru LJ-116.

2. The AN386-1-11 taper pin was replaced by an AN4-16 bolt starting at S/N LJ-296. Service Bulletin No. 67-27 requested that the taper pin in S/N LJ-117 thru LJ-295, plus any taper pins installed per SL 66-29, be replaced by an AN5-16 bolt. SB 67-27 supersedes and cancels SL 66-29.

3. Airplanes S/N LJ-296 and after and LW-1 and after have been delivered with AN4-16 bolts.

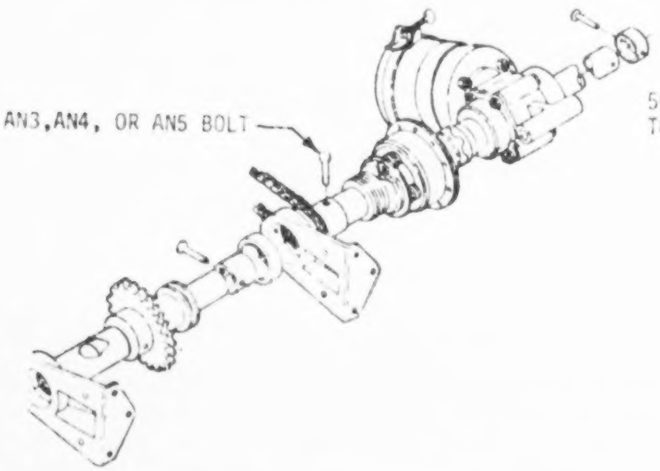
4. The sprocket, torque shaft, and gearbox prior to S/N's LJ-854 and LW-327 were manufactured with a 3/16" bolt hole, and were reamed to a 1/4" hole during factory assembly. These three items, when sold for Spares, have 3/16" holes which must be enlarged to 1/4" by the installer.

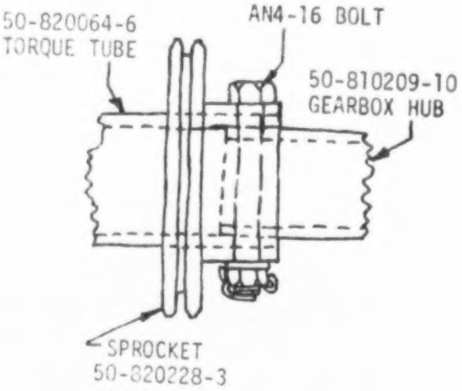
5. Starting at S/N's LJ-854 and LW-327, the above three items are manufactured with 1/4" bolt holes, which eliminates the production-line (and in-service) reaming and the possibility of double-drilling or elongating the holes. Service Instruction No. 1049 pertains to this change.

6. New P/N's have been assigned to the 1/4" hole components:

| Part | Part Number |
|---|---|
| SPROCKET | 50-820228-3 |
| TORQUE TUBE | 50-820064-6 |
| GEAR BOX HUB | 50-810209-10 |
| GEAR BOX ASSY W/MOTOR | 91-810010-605 |
| GEAR BOX ASSY W/O MOTOR | 91-810010-657 |

7. The -605/-657 gearbox assemblies can be used on airplanes prior to S/N's LJ-854/LW-327 which have AN4 bolts."





| | | |
|---|---|---|
| Beech<br>Model B100 | Brackets<br>P/N 115-440031-1 and 2 | While shaking the horizontal stabilizer during an inspection, a "bang" noise was heard. An investigation disclosed the AN 4 bolts which secure the stabilizer brackets were loose, and one of the bolts was too short (only two threads were engaged in the nut). The "bang" noise was eliminated by installing one new bolt and applying proper torque to all bolts. Submitter suggested checking other King Air 100 aircraft for this condition. Aircraft time—665 hours. |

## BELL

| | | |
|---|---|---|
| Bell<br>Model 47G-5 | Broken Bolt<br>P/N AN 174-26 | The bolt, connecting the fore and aft cyclic control push-pull tube, was found loose; and the bolt head was broken off. Bell Helicopter Textron has an Operations Safety Notice, OSN GEN-76-3, dated September 24, 1976, that states in part "Bell standard bolts are now used in all critical control applications. The Bell standard bolt that replaces the bolt, P/N AN 174-26, is 20-057-4-38D." |

## BELLANCA

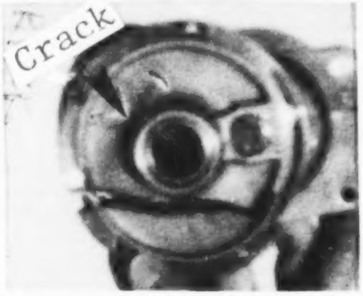
| | | |
|---|---|---|
| Bellanca<br>Model 7GCBC | Carburetor Air Box | The carburetor flange adapter rivets elongated the holes in the aluminum plate. The hot air adapter was very loose. Submitter advised this unit was assembled with hollow-type rivets and suggested using AN 470 rivets in lieu of the S1793X.125 rivets. Aircraft time—672 hours. |

## CESSNA

| | | |
|---|---|---|
| Cessna<br>Model 152 | Chafed Fuel Lines | There have been two recent reports of the fuel lines chafing against the door channel support brackets. This condition was found on the left and right side of both aircraft. Split tubing was installed around the fuel lines to prevent further chafing. |
| Cessna<br>Model 152 | Fuel Quantity Markings | The placards for both fuel tanks read 19 gallons per side with a 37.5 gallon total capacity. The actual tank capacities were 13 gallons per side with a total capacity of 24.5 gallons. The serial number of the aircraft is not included within the serial number range listed in Airworthiness Directive 81-05-01. |
| Cessna<br>Model 172N | Gear Housing<br>P/N MZ1390 | |

The starter gear housing assembly was found cracked and broken along the lower part of the housing. The weight of the starter is held by this housing. Submitter advises the housing is visible without removing the cowling and recommends the area be inspected during preflight. Aircraft time—251 hours.

During the past 5 years, there have been similar reports on Beech A24, Cessna 172 and 175, Gulfstream American AA-5B, Mooney M20, and Piper PA-31 aircraft.



Cessna Models
150, A150,
152, A152

Fuel System Drainage

The following article contains information published in Alert No. 35, dated June 1981, and in a special alert mailed in September 1981 to all owners of record of the subject aircraft. Recent reports of engine stoppage because of ice and water in the fuel line at the tee-drain location necessitate reissuance.

The aircraft engine lost power during climb which resulted in an emergency landing. An after-landing investigation revealed ice in the main fuel line between the shutoff and the gascolator. There have been other instances reported during the past winter of ice and/or water in the fuel line at the tee-drain location resulting in loss of engine power or engine stoppage. The pilot in this report had drained fuel at the tee fitting during the preflight check, but there was only a trickle instead of the normal steady stream. In order to more easily accomplish removal of water from the fuel system and to provide additional safeguards against the accumulation of water, the following recommendations are offered:

1. Install a quick drain at the tee-drain location. The following Supplemental Type Certificates have been issued for a quick drain at that location. Any other approved quick-drain installation may also be used.

SA1615CE - Wells Aircraft, Inc.
Municipal Airport
P.O. Box 858
Hutchinson, Kansas 67501

SA4278WE - Aircraft Metal Products Corp.
4206 Glencoe Avenue
Venice, California 90291

SA1235SO - Middle Tennessee A/C Components
P.O. Box 472
Smithville, Tennessee 37166

SA1287NW - Stratton Aero Enterprises
Eaglerock Airport
13629 - 250th N.E.
Arlington, Washington 98223

Cessna Service Information Letter No. SE81-24, dated June 8, 1981, pertains to Service Kit No. SK152-13A Fuel System Quick-Drain Modification.

2. Before the first flight of the day and after each refueling, use a clear sampler cup and drain a small quantity of fuel from each fuel tank sump quick drain, fuel line tee quick drain, and pull out strainer drain knob for about 4 seconds to clear fuel strainer of possible water and sediment. Check drained fuel for water, sediment, and proper fuel grade. If water is observed, the fuel system may contain additional water, and further draining of the system will be necessary.

3. Fuel airplane after each flight, and keep fuel tanks full to minimize moisture condensation.

4. Fuel additives may be used when operating under certain cold weather conditions. Refer to the applicable pilot's operating handbook or service manual, or Cessna Service Information Letter SE79-30, dated June 18, 1979, for instructions regarding the use of fuel additives.

5. Maintain all fuel cap and filler neck gaskets in good condition to prevent moisture entering into fuel tanks during periods of rain, snow, etc.

NOTE: Cessna Service Information Letters listed above may be obtained from Cessna Aircraft Company, Marketing Division, Attention: Customer Service Department, Wichita, Kansas 67201, telephone (316) 685-9111.

| | | |
|---|---|---|
| Cessna Model 172M | Cut Brake Line P/N 0500118-87 | The aircraft owner had complained of not being able to maintain satisfactory right brake action. An investigation revealed the elevator cable had nearly cut completely through the brake line at fuselage station 56.70. |
| Cessna Model 172N | Water Damage | There have been three recent reports of inoperative ARC RT385A Nav/Comm receivers because of water damage. Submitter advised the water entered the units through the ram air cooling openings. |

| | | |
|---|---|---|
| Cessna<br>Model 172P | Seatbelt Bolts | The bolts that secure the rear seatbelts to the cabin floor were found with no more than three threads engaged in the nut plate beneath the cabin floor. Removal of the bolts revealed incorrect (AN 4-5A) bolts were being used instead of AN 4-6A bolts. Aircraft time—211 hours. |
| Cessna<br>Model P182 | Battery Box<br>Drain Nipple | The firewall, solenoids, and wires under the battery box were found corroded. Inadequate sealing of the battery box drain hose allowed battery acid to leak into the area. Aircraft time—925 hours.<br>NOTE: Related article and picture in Alert No. 38, dated September 1981. |
| Cessna<br>Model P210 | Link Assembly<br>P/N 1260741-1 | The link assembly was found cracked during an annual inspection. The link is attached to the elevator down spring. Submitter recommended checking the link at the next inspection for a possible crack. Aircraft time—634 hours. |
| Cessna<br>Model 441 | Skin Cracks | The vertical stabilizer skin was found cracked on the left side just above the flux valve inspection plate. The repair station submitting the report advised this was the second aircraft with skin cracks in this location. Time on the reported aircraft—298 hours. |

## EMBRAER

| | | |
|---|---|---|
| Embraer<br>Model EMB-110 | Fire Detector Systems | Fire detection system problems, including water penetration, have caused false fire warnings. Design improvements are provided by Embraer Service Bulletins 110-26-002 and 110-26-003 and Information Bulletin 110-26-002. Compliance with the provisions of these bulletins should prevent the system failures. |
| Embraer<br>Model EMB-110P1 | Elevator Cables | There have been reports of frayed elevator cables and broken strands at the fair-lead aft of the rear spar and at the second pulley upward in the empennage. |

## GATES LEARJET

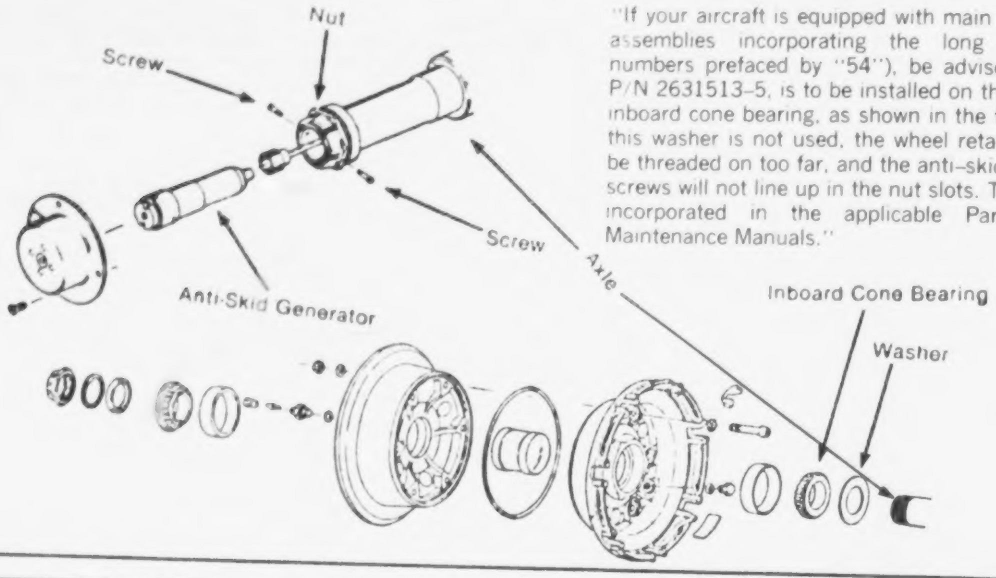
| | | |
|---|---|---|
| Gates Learjet<br>Model 20, 30,<br>and 50 Series | Garrett Pressurization<br>Module | The following information is excerpted from Gates Learjet Service News Letter No. 68, dated February/March 1982:<br>"When installing the Garrett Pressurization Module, there has been a recurring problem in the field with kinking or restricting of the pneumatic soft control lines and hoses of the instruments providing vacuum and static functions to the module and outflow valve. Impaired pressurization control or complete pressurization failure may result.<br>"When fastening the module on final installation, make sure that all electrical wiring is tied up and stowed and that general good housekeeping practices have been followed.<br>"After the module is installed, it may be necessary to remove some comm or nav control heads on the center instrument panel and visually or physically check to assure none of the lines or hoses are kinked or restricted. A pressurization operational check should be performed per applicable Maintenance Manual." |

Gates Learjet
All models

Main Landing
Gear Wheel

The following information is excerpted from Gates Learjet Service News Letter No. 68, dated February/March 1982:

"If your aircraft is equipped with main landing gear strut assemblies incorporating the long axles (assembly numbers prefaced by "54"), be advised that a washer, P/N 2631513-5, is to be installed on the axle prior to the inboard cone bearing, as shown in the following figure. If this washer is not used, the wheel retaining axle nut will be threaded on too far, and the anti-skid generator attach screws will not line up in the nut slots. This washer will be incorporated in the applicable Parts Catalog and Maintenance Manuals."



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## HAWKER SIDDELEY

Hawker Siddeley
Model HS.125-700A

Wing Flap and Vane

During an after-landing inspection, the pilot noticed the top skin on the left wing flap was cracked. The skin was cracked from the leading edge to the trailing edge. The crack was 37 inches from the inboard end of the flap and 12 inches outboard of the jackscrew. The wing flap main spar was found cracked through in the same area. There was also damage to the inboard side of the left aileron.

The previous article was published in Alert No. 45, dated April 1982. Further investigation revealed that apparently the flap was broken from overloads imposed from contact with snow (windrows 1-inch deep) on the runway during landing. The inboard end of the aileron was believed damaged when the broken flap was raised from the 75° LIFT DUMP position after landing.

Section 2, page 19 of the HS.125-700A Crew Flight Manual, contains the following information for landing on very wet, snow-covered, or slush-covered runways:

F. Very wet or slush-covered runway

Ground clearance with flaps lowered is relatively small; and when operating on a runway with deep puddles, slush, snow, or ice:

(1) Ensure as far as possible that the landing does not result in a go-around after touchdown.

(2) After every such landing or aborted takeoff, avoid retracting the flaps, if practical. Examine the top and bottom surfaces of the flaps and adjacent structure for damage, preferably with flaps in the LIFT DUMP position. Also, ensure that there is no slush, snow, or ice between flap and wing structure.

(3) After examination, if the flaps are confirmed to be undamaged, report the fact to the person responsible for the aircraft's maintenance. Each flap inboard hinge bolt must be examined for signs of overloading at the first convenient opportunity but not later than the next Service A inspection.

Owners and operators of Hawker Siddeley HS.125-700A aircraft should be aware of the problems associated with the flap breakage when landing on runways with deep puddles, slush, snow, or ice and the possible aileron interference that can occur if a broken flap is retracted.

## HUGHES

| | | |
|---|---|---|
| Hughes<br>Model 369D | Output Bearing<br>P/N 369A5361 | The pilot thought there was a power failure while hovering the aircraft. An investigation revealed the clutch output shaft failed after failure of the output bearing. This failure caused a power separation between the engine and transmission. Bearing total time was not indicated, but the clutch had been overhauled 174 hours prior to bearing failure. |

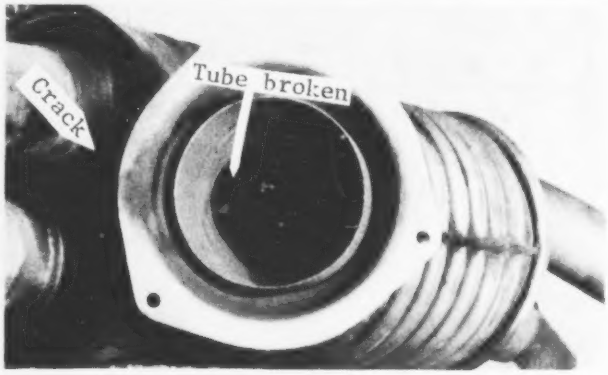
## ISRAEL AIRCRAFT

| | | |
|---|---|---|
| Israel<br>Model 1124 | Strut Bearing | The nose steering was erratic and would not readily return to center. Disassembly of the upper strut revealed the lower steering bearing was corroded and starting to disintegrate. Nose steering operation was normal after bearing replacement. This condition was found on two separate aircraft. Aircraft times—902 and 1,290 hours. Submitter suggested inspecting and lubricating the bearings at 600-hour inspections. |

## MOONEY

| | |
|---|---|
| Mooney<br>Model M20C | Exhaust Muffler |

The internal baffle tube deteriorated and broke. The structural integrity of the muffler was lost which caused an exterior crack around the No. 1 exhaust port into the muffler. Total time on the muffler—318 hours.

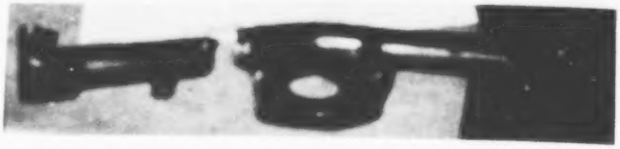


## PIPER

| | | |
|---|---|---|
| Piper<br>Model PA-23-250 | Emergency Exit Window | During an inspection, the emergency exit window actuator was difficult to move. Approximately 1 pint of water ran out of the window after the window was removed. Water had apparently leaked in between the window and the exterior skin. The accumulated water in the bottom of the window had caused the bearings to rust. Submitter recommends the window should be inspected for condition and ease of operation each 100 hours. |
| Piper<br>Model PA-23-250 | Pilot - Copilot<br>Control Column | A pilot noticed an uneven or unsynchronized travel between his and the copilot's control wheel. An inspection of the control column revealed nearly a complete separation of the vertical tubular member of the lower horizontal bearing tube. There was no indication of failure at any welded joint. The failure was confined to the horizontal tube. Time on the aircraft—approximately 3,000 hours. |

Piper
Model PA-28-140

Steering Horn
P/N 69247-00



Rudder control was lost during flight. An investigation revealed the nosewheel steering horn assembly had broken on the left side. Improper towing procedures were a probable cause for the broken horn. The operator has installed a caution placard where the towbar mounts.

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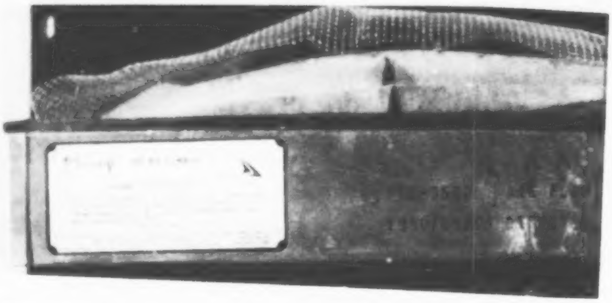
Piper
Model PA-31-350

Air Filter



The left engine air filter screen was found loose, and the filter material had pulled out of the filter housing, blocking the intake. This condition was found during a 100-hour inspection. Inspection of the right engine air filter revealed a similar condition but not as severe. Time on the filters—572 hours.

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Piper
Model PA-31T

Fuel Tip Tank
Mount Bolts

During a routine inspection, the left fuel tip tank front mount bolts were found loose or missing. The upper bolts were missing, whereas the lower bolts were still holding by a thread. The tank could be moved vertically for about 2 inches. The right fuel tip tank was checked and found to be intact. This same condition was found with the left tip tank of another PA-31 aircraft. Time on the aircraft—2,666 hours.

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Piper
Model PA-32R-300

Alternator Belt
P/N 452823

The original alternator belt, P/N 452572, was replaced because of wear. A new thinner Polyflex belt was installed. The new belt broke within 2 hours' flight time after installation. Another P/N 452823 Polyflex belt was installed, and it broke on the first takeoff roll after being installed.

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Piper
Model PA-34-200T

Support Assembly
P/N 37112-00

The left engine mount support assembly was found cracked at the forward attach point. Water was inside the tube, and there was severe corrosion at the forward and aft ends. Aircraft time—158 hours.

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Piper
Model PA-34-200T

Propeller Deice
Boot Wires

Fifty hours after installing an overhauled propeller with new boots, the boot feed wires shorted to the propeller spinner. The wires have been reworked three times since for the same problem in an additional 400 hours of operation. The submitting repair station advised this problem is prevalent on PA-34-200T aircraft.

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Piper
Model PA-36

Fuselage Longerons

During a routine inspection, the forward fuselage upper longerons were found cracked. The area affected was the upper engine mount attach bolt and gusset plate. Four reports were received concerning this discrepancy. The times on the aircraft ranged between 1,283 and 1,842 hours. Aircraft serial numbers are not included in Airworthiness Directive 79-12-09.

## SHORT BROTHERS LIMITED

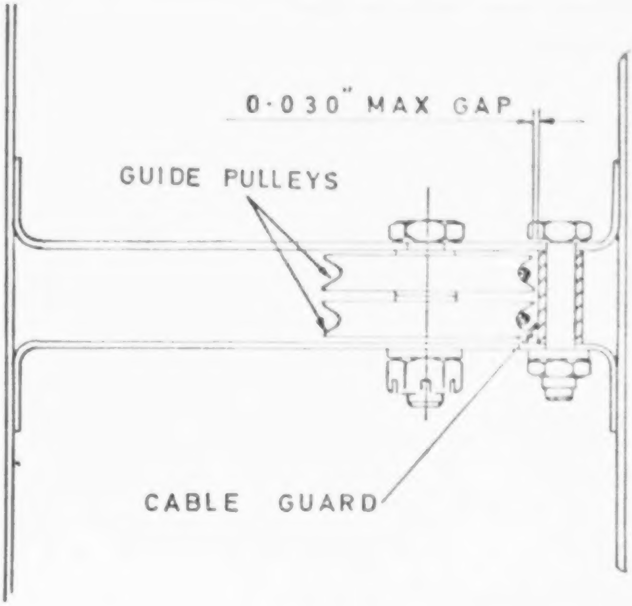
Short Brothers
Model SC-7 Series 3

Aileron Servo Cable

The control cable connecting the aileron autopilot servo motor capstan to the primary control circuit slipped past its cable guard and became trapped between the two guide pulleys at station 226.

Entrapment of the aileron servo cable jammed the aileron control when the autopilot was used, and subsequent manual override of the autopilot caused breakage of the trapped cable.

Short Brothers Service Bulletin 22-A59 provides procedures to inspect the control cable for damage and provides clearance for the cable guard.



## SWEARINGEN

Swearingen
Model SA226-TC

Corroded Switch

The right wing overheat light illuminated and remained on during final approach. There were no indications of fire or overheat in the right wing. The thermal switch in the right wing root air conditioning duct was found corroded. Replacing the corroded thermal switch corrected the problem.

Swearingen
Model SA226-TC

Door Hinge Bolt

The aircraft was landed gear up after the left landing gear could not be extended. An investigation disclosed the left inboard landing gear door aft hinge arm attach bolt had backed out. The plate nut in the hinge bracket was stripped. The gear door shifted which prevented gear extension. Fairchild Swearingen Service Bulletin SB32-026 pertains to safety wiring of the door hinge bolts.

NOTE: Related article in Alerts No. 50, dated September 1982, and No. 42, dated January 1982.

## UNIVAIR

Univair (Ercoupe)
Model 415C

Aileron Bellcrank
P/N 415-52305

The subject bellcrank was found cracked when removed for cleaning and inspection during restoration of the aircraft. Overtorque of the bolt without proper clearance may have caused the bellcrank to crack. Submitter recommended a one-time inspection for this condition.

# ACCESSORIES

## AIRBORNE

| | |
|---|---|
| Airborne<br>Vacuum Pump<br>Models 441CC<br>and 442CW | Mounting Pads |

Reports of broken vacuum pump mounting pads continue to be received. The pump rotors were free with no indication of internal pump problems. Recent reports were on Cessna 207, 337, Piper PA-31 and PA-34 aircraft. Pump times—145 to 316 hours.

## BENDIX

| | | |
|---|---|---|
| Bendix<br>Magneto<br>Model D6RN-2230 | Magneto Coil<br>P/N 10-382588 | The pilot reported the magneto on the right engine of a PA-31 was inoperative. The magneto was removed for repair and compliance with Bendix Service Bulletin No. 617. One coil was found burned through the insulation, and the distributor block was cracked around the bearing area. |

## SLICK

| | | |
|---|---|---|
| Slick<br>Magneto<br>Models 662 | Loose Pawl Rivets | The pawl rivets were found loose in two magnetos. The magneto's serial numbers were not included in the serial number range of Airworthiness Directive 74-18-05. Both magnetos did have the new style M-2369 impulse couplings installed. |

# ENGINES

## PRATT AND WHITNEY OF CANADA

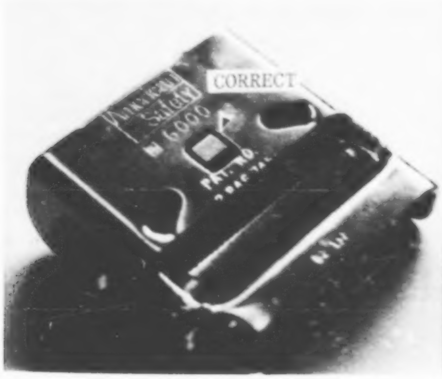
| | | |
|---|---|---|
| Pratt and Whitney<br>of Canada<br>Model PT6A-41 | Oil Scavenge Pump<br>P/N 3024284 | There have been reports of oil loss from holes eroded through the scavenge pump housing. Beech King Air 200 Communique No. 24, dated August 24, 1979, relates to the problem. Pratt and Whitney of Canada Service Bulletin No. 3119R2 pertains to scavenge pump housing cavitation erosion. Pratt and Whitney of Canada recommends compliance with the service bulletin when disassembly of the engine is sufficient to afford access to the affected part. |

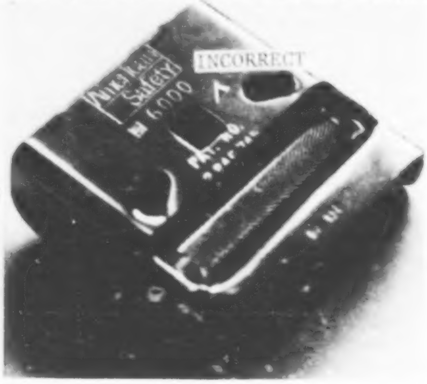
Advisory Circular 91-13C provides background and guidelines relating to operation of aircraft in the colder climates where wide temperature changes can occur.

# EQUIPMENT

## AMERICAN SAFETY EQUIPMENT CORP.

| | | |
|---|---|---|
| American Safety<br>Lap Belt Assemblies<br>Model 6000 | Buckle<br>P/N 501160-401 | The latch for the buckle has been found incorrectly installed which prevents positive latching. In this condition, the lap belt fails with a 15-pound pull force. |





# OF INTEREST

### SINGING WING STRUTS

The following article is excerpted from a pilot report:

"On May 21, 1982, I was flying a Cessna TU206, at 7,000 MSL, OAT +8° C corrected temperature, 150 IAS, 2300 RPM, 27" MAP, 15.6 GPH fuel flow, EGT 1380° F (50° rich), CHT 380° F, oil temp 160° F, oil pressure 55 PSI. In smooth air, between cloud layers, and in level flight, a high frequency low amplitude vibration began. Power, RPM, and mixture change did not change the vibration in any way. The vibration could be felt in the controls but could not be described as control induced. The wing struts were vibrating so rapidly, approximately ±1/2", that they were blurred and the main landing gear fairings were vibrating at a lesser frequency.

"My first subjective thought was that a blade had cracked and when power was reduced to 12" MAP to initiate a precautionary off airport landing, the vibration abruptly ceased. Cautious power/RPM/airspeed changes disclosed that the vibration restarted above 23" MAP and abruptly ceased when the propeller was returned to low blade angle. A normal landing was made at the airport of intended landing.

"Investigation of the engine, mounts, fuel system, and airframe disclosed no discrepancies worthy of note. The propeller, a Hartzell Q-tip, had 0.5° maximum difference in low blade angle and 0.021" difference in concavity of the blade faces at the 30" station.

"A Cessna single-engine service representative disclosed that this 'singing strut syndrome' had been reported a few times (all with McCauley propellers), and the probable cause was moisture laden air. The suggested cure was to rotate the upper and lower lift strut bolts and retorque to book values. The propeller was also replaced due to the blade angle discrepancy and a minor propeller vibration since new.

"It is this writer's subjective opinion that in certain meteorological conditions, a very minor propeller vibration can cause the lift struts to vibrate at their natural frequency, and when the vibration from the propeller is removed, (such as at low blade angle), the struts return to their stable state.

"The airplane has been flown in very similar weather conditions with the new propeller installed, and the struts could not be made to vibrate."

# MAINTENANCE NOTES

## ALUMINUM ALLOY TUBING

The Aluminum Association, Inc. has called attention to the possible misapplication of aluminum alloy tubing in high pressure hydraulic systems and to the importance of using tubing produced to the proper specifications for these applications. Failure to use proper tubing could lead to serious accidents.

Aluminum alloy tubing is routinely produced in a variety of size and alloy/temper combinations to industry standards such as ASTM B-210, "Standard Specification for Aluminum-Alloy Drawn Seamless Tubes," and to Federal Specification WW-T-700, "General Specification for Tube, Aluminum and Aluminum Alloy, Drawn, Seamless." These specifications have varying leak test provisions (pressure or eddy current) that may be employed at the purchaser's option. In general, however, the pressure requirements involved are in the order of 250 PSI and below. Hence, these specifications are not intended to cover tubing for high pressure hydraulic systems.

For high pressure hydraulic applications, more stringent specifications apply. These include MIL-T-7081D (AUG), "Military Specification for Tube, Aluminum Alloy, Seamless, Round, Drawn, 6061, Aircraft Hydraulic Quality;" AMS 4081D, "Aluminum Alloy Tubing, Hydraulic, Seamless, Drawn, Round (6061-T4);" AMS 4071H, "Aluminum Alloy Tubing, Hydraulic, Seamless, Drawn, Round (5052-0);" AMS 4083G, "Aluminum Alloy Tubing, Hydraulic, Seamless, Drawn, Round (6061-T6);" and AMS 4086J, "Aluminum Alloy Tubing, Hydraulic, Seamless, Drawn (2024-T3.)" These specifications require the tubing to have much higher hydraulic pressure capabilities, varying with the alloy and temper.

Hence, it is very important that the designer, manufacturer, and field maintenance and repair people working on high pressure hydraulic systems use tubing produced and identified to the proper specifications.

## AIRCRAFT COVERINGS

Aircraft are being returned to service with the Stits Poly-Fiber STC (Supplemental Type Certificates) SA1008WE as the approval basis. Fabrics, tapes, thread, cement, or coatings other than those specified in the STC have been substituted for the materials specified in the STC. These nonconformities may result in an unsafe condition or invalidate the aircraft certificate of airworthiness. Deviation from the provisions of an STC, other than minor repairs, must be approved as additional alterations.

## FLIGHT CONTROL SYSTEMS

There are 804 records in the service difficulty data bank of flight control system discrepancies that were reported in the past 2 years. The reports are on aircraft weighing under 12,500 pounds. Several of the reports indicate that inadequate maintenance practices are contributing to the problem. Other reports indicate that inadequate factory checks of new aircraft also contribute to the problem. Although many of these discrepancies were found during routine inspections, others went undetected until the failure occurred in flight. This, in some cases, led to other complications that terminated in a serious or costly incident.

The following list contains examples of the major unsatisfactory conditions being reported. It should be noted that all of the problems arising are not limited to these alone. Further, these reported conditions were found or had developed on many makes and models of aircraft.

1. Interference between the cockpit control and adjacent structure, equipment, wiring, plumbing, or other controls.

2. Control cables incorrectly routed, twisted, frayed, or worn at fair-leads, pulleys, anti-abrasion strips, and guards. Also, cables corroded because of atmospheric conditions or battery acid and vapors.

3. Cable attach pins or bolts excessively worn, pulleys worn extensively and pulley brackets damaged, misaligned, or inadequately secured.

4. Push-pull tubes or rods bent, cracked, or broken because of rod end bearings not being lubricated periodically, improperly installed, or for other causes which were not determined.

5. Cotter pins missing from bolts, control cable turnbuckles not saftied, stop blocks improperly installed, and nuts missing from cable clevis bolts.

Certain flight control system problems appear to be more prevalent on certain aircraft such as:

Beech 35 – Elevator and rudder control tubes corroded from water entry.

Beech 99 – Elevator pulley brackets cracked.

Cessna 152 – Rudder cable frayed at rear pulley.

Cessna 172 – Elevator bellcrank bracket broken.

Cessna 188 – Aileron cable worn/frayed at pulley where wing joins center section.

Cessna 441 – Cables chafing on air distribution ducts.

Embraer 110P – Aileron cables frayed in wheel wells.

Piper PA-28 – Rudder bar support bracket cracked.

Piper PA-31 – Elevator trim tab cable frayed at trim servo.

Piper PA-31 – Elevator bellcrank bearings worn and/or loose.

Piper PA-38 – Elevator trim tab springs broken.

Piper PA-44 – Elevator trim tab cables frayed and/or broken.

Swearingen SA226TC – Bolts worn that attach rudder pedal link to forward end of rudder cables.

Many of the preceding problems identified require time to develop. Safe and reliable operation depends upon early detection and prompt corrective action. Should there be any question regarding the maintenance of these systems, it is suggested the pertinent manufacturer's service data be referenced. The use of such information is very important in assuring the continued satisfactory operation of the flight control systems in aircraft.

## WINTER WEATHER MAINTENANCE

Each winter aircraft service experience reports indicate the operation of aircraft in wet and cold weather is both hazardous and costly, if good winter preventive maintenance practices are disregarded.

Of utmost importance is the cabin air heating systems and the dangers associated with any form of system leakage that would allow carbon monoxide to enter the area occupied by the crew and passengers. It is a good practice to supplement cabin heating system inspections with periodic carbon monoxide detection tests, especially in those cases where visual inspections are infrequent. Carbon monoxide tests are reliable and may be accomplished quickly without any disassembly operations. Such tests, however, are not conclusive, as the state of preservation and actual condition of the component parts of any heating system can only be determined by visual inspection.

NOTICE TO READERS: The General Aviation Airworthiness Alerts are, for the most part, prepared from information supplied by those who operate and maintain aircraft. The FAA encourages the reporting of all malfunctions or defects that come to the attention of service or operating personnel, even though the problem has been previously reported. FAA Form 8010-4, Malfunction or Defect Report, which supersedes FAA Form 8330-2, Malfunction or Defect Report, is available from the local General Aviation District Office and may be used for reporting purposes.

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